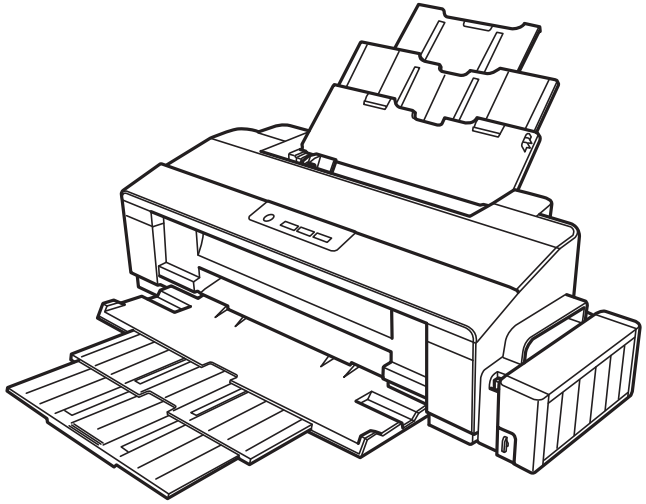
SERVICE MANUAL



Color Inkjet Printer

L1800

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SEIJ13-007

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PRECAUTIONS

Precautionary notations throughout the text are categorized relative to 1)Personal injury and 2) damage to equipment.

DANGER Signals a precaution which, if ignored, could result in serious or fatal personal injury. Great caution should be exercised in performing procedures preceded by DANGER Headings.

WARNING Signals a precaution which, if ignored, could result in damage to equipment.

The precautionary measures itemized below should always be observed when performing repair/maintenance procedures.

DANGER

1. ALWAYS DISCONNECT THE PRODUCT FROM THE POWER SOURCE AND PERIPHERAL DEVICES PERFORMING ANY MAINTENANCE OR REPAIR PROCEDURES.
2. NO WORK SHOULD BE PERFORMED ON THE UNIT BY PERSONS UNFAMILIAR WITH BASIC SAFETY MEASURES AS DICTATED FOR ALL ELECTRONICS TECHNICIANS IN THEIR LINE OF WORK.
3. WHEN PERFORMING TESTING AS DICTATED WITHIN THIS MANUAL, DO NOT CONNECT THE UNIT TO A POWER SOURCE UNTIL INSTRUCTED TO DO SO. WHEN THE POWER SUPPLY CABLE MUST BE CONNECTED, USE EXTREME CAUTION IN WORKING ON POWER SUPPLY AND OTHER ELECTRONIC COMPONENTS.
4. WHEN DISASSEMBLING OR ASSEMBLING A PRODUCT, MAKE SURE TO WEAR GLOVES TO AVOID INJURIER FROM METAL PARTS WITH SHARP EDGES.

WARNING

1. REPAIRS ON EPSON PRODUCT SHOULD BE PERFORMED ONLY BY AN EPSON CERTIFIED REPAIR TECHNICIAN.
2. MAKE CERTAIN THAT THE SOURCE VOLTAGES IS THE SAME AS THE RATED VOLTAGE, LISTED ON THE SERIAL NUMBER/RATING PLATE. IF THE EPSON PRODUCT HAS A PRIMARY AC RATING DIFFERENT FROM AVAILABLE POWER SOURCE, DO NOT CONNECT IT TO THE POWER SOURCE.
3. ALWAYS VERIFY THAT THE EPSON PRODUCT HAS BEEN DISCONNECTED FROM THE POWER SOURCE BEFORE REMOVING OR REPLACING PRINTED CIRCUIT BOARDS AND/OR INDIVIDUAL CHIPS.
4. IN ORDER TO PROTECT SENSITIVE MICROPROCESSORS AND CIRCUITRY, USE STATIC DISCHARGE EQUIPMENT, SUCH AS ANTI-STATIC WRIST STRAPS, WHEN ACCESSING INTERNAL COMPONENTS.
5. REPLACE MALFUNCTIONING COMPONENTS ONLY WITH THOSE COMPONENTS BY THE MANUFACTURE; INTRODUCTION OF SECOND-SOURCE ICs OR OTHER NON-APPROVED COMPONENTS MAY DAMAGE THE PRODUCT AND VOID ANY APPLICABLE EPSON WARRANTY.
6. WHEN USING COMPRESSED AIR PRODUCTS; SUCH AS AIR DUSTER, FOR CLEANING DURING REPAIR AND MAINTENANCE, THE USE OF SUCH PRODUCTS CONTAINING FLAMMABLE GAS IS PROHIBITED.

About This Manual

This manual describes basic functions, theory of electrical and mechanical operations, maintenance and repair procedures of the printer. The instructions and procedures included herein are intended for the experienced repair technicians, and attention should be given to the precautions on the preceding page.

Manual Configuration

This manual consists of six chapters and Appendix.

CHAPTER 1.PRODUCT DESCRIPTIONS
Provides a general overview and specifications of the product.

CHAPTER 2.TROUBLESHOOTING
Describes the step-by-step procedures for the troubleshooting.

CHAPTER 3.DISASSEMBLY / ASSEMBLY
Describes the step-by-step procedures for disassembling and assembling the product.

CHAPTER 4.ADJUSTMENT
Provides Epson-approved methods for adjustment.

CHAPTER 5.MAINTENANCE
Provides preventive maintenance procedures and the lists of Epson-approved lubricants and adhesives required for servicing the product.

APPENDIX Provides the following additional information for reference:
• Connector Summary

Symbols Used in this Manual

Various symbols are used throughout this manual either to provide additional information on a specific topic or to warn of possible danger present during a procedure or an action. Be aware of all symbols when they are used, and always read NOTE, CAUTION, or WARNING messages.

Indicates an operating or maintenance procedure, practice or condition that is necessary to keep the product's quality.

Indicates an operating or maintenance procedure, practice, or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

May indicate an operating or maintenance procedure, practice or condition that is necessary to accomplish a task efficiently. It may also provide additional information that is related to a specific subject, or comment on the results achieved through a previous action.

Indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

Indicates that a particular task must be carried out according to a certain standard after disassembly and before re-assembly, otherwise the quality of the components in question may be adversely affected.

Revision Status

Revision	Date of Issue	Description
A	February 10, 2014	First Release

CONTENTS

Chapter 4 Adjustment

Chapter 5 Maintenance

Chapter 6 Appendix

CHAPTER

1

PRODUCT DESCRIPTION

1.1 Operation Buttons & Indicators (LEDs)

1.1.1 Operation Buttons

The printer has the following four operation buttons.

Table 1-1. Operation Buttons

Button	Function
Power	Turn the power of this unit on/off.
Paper	In motion:Release error In Idle: Load and Eject paper
Ink	Start Initial Ink Charge or Head cleaning.
Cancel	In motion:Cancels the job execution / Release error

1.1.2 Indicators (LEDs)

Three indicators (LEDs) are provided to indicate settings or printer status.

Table 1-2. Indicators (LEDs)

LED	Function
Power LED (green)	Indicates power on/off.
Paper LED (red)	Indicates paper error.
Ink LED (red)	Light when the maintenance error occurring.

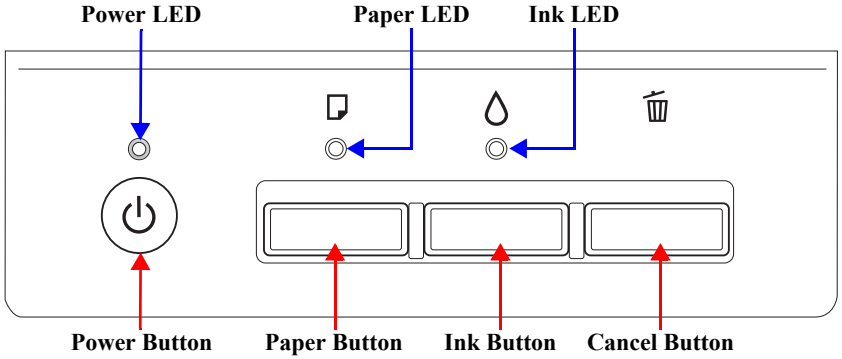


Figure 1-1. Buttons & LEDs

1.1.3 Operation Buttons & LEDs Functions

Detailed information on the buttons and LEDs functions are listed below.

Table 1-3. Operation Button Functions

Button	Printer Status	Function
Power	Off	■ Turns the power on.
	On	■ Turns the power off.
Paper	On	■ When the condition is Idle, Loads and Ejects the paper. ■ When the following condition, loads the paper by pressing this key. Release the error display and continue the procedure if the paper loading is success. • Paper Out Error • Multiple Feed Error • Ink waste pad near end error ■ When the following condition, ejects the paper by pressing this key. Release the error display and continue the procedure if the paper ejecting is success. • Paper jam error
Ink (Press 3 seconds or more)	On	■ Runs a head cleaning. ■ Runs a Initial Ink Charge.
Cancel	On	■ Stop printing, and cancel the job of print. ■ When the error occurs, it cancels error release & stops printing and ejects the paper if it exists.
Paper + Power	On	■ Print nozzle check pattern after normal Initializing procedure is done. ■ If initial ink fill is not done, execute only initial ink fill. Printer does not print nozzle check pattern.

Table 1-4. Indicators (LEDs) Function

Printer Status	Indicators (LEDs)			Priority*1
	Power	Paper	Ink	
Power off (shutting down)	Flashes at high speed	--	--	1
Firmware update (While preparing)	--	--	--	2
Firmware update (Starting)	Flashes	OFF	OFF	
Fatal error	OFF	Flashes at high speed	Flashes at high speed	3
Ink waste pad overflow error	--	Flashes alternately 1	Flashes alternately 2	4
Ink waste pad near end error	--	Flashes alternately 1	Flashes alternately 2	5
Paper jam error	--	Flashes	--	6
Initial Ink Charge Preparing	Flashes	--	OFF	7
Initial Ink Charge Waiting	ON	--	ON	8
Initial Ink Charging	Flashes alternately 1	--	Flashes alternately 2	9
Multi-feed error	--	ON	--	11
Paper out error	--	ON	--	12
Ink Sequence	Flashes	--	--	13
PC Printing	Flashes	--	--	14
Stop printing & job canceling	Flashes	--	--	15
Loading / Ejecting	Flashes	--	--	16
Power On Sequence	Flashes	--	--	17
Idle	ON	--	--	18
Reset Requirement*2	ON	ON	ON	--

Note *1: When two or more errors occur at the same time, the one with higher priority will be indicated.

*2: The all LEDs light for 0.2 seconds when a reset requirement is received.

Note : --:No change
Flash: Repeats turning On and Off every 1.25 seconds.
Flash at high speed: Repeats turning On and Off every 0.5 seconds.
Flashes alternately 1:Same as the “Flash”
Flashes alternately 2:Repeats turning Off and On every 1.25 seconds.

1.1.4 Errors & Remedies

Table 1-5. Errors & Remedies

Error	Occurrence terms	How to release
Fatal error	When the unit detects an error which is impossible to work correctly.	Turn off and restart the unit. (If occurs repeatedly, it must be repaired.)
Ink waste pad overflow error	When the ink waste fluid comes full.	Turn off the unit. Change the absorber in the printer enclosure by a service person. and write EEPROM's data.
Ink waste pad near end error	When the ink waste fluid nears full capacity.	■ Press the Release error key. ■ By pressing the Stop key, it cancels print data.
Paper jam error	When the paper loading or paper ejecting is not success.	■ Remove paper and push the Release error key to continue. ■ By pressing the Release error key, ejects the paper and continue the procedure if the paper ejecting is success. ■ By pressing the Cancel key, it cancels error display and cancels print data and returns from error status.
Paper out error	Failure to load paper to print.	■ Set paper and push the Release error key to continue. ■ By pressing the Release error key, feeds the paper and continue the procedure if the paper feeding is success. ■ By pressing the Stop key, it cancels error display and cancels print data and returns from error status.
Multiple feed error	When the paper is ejected without printing. When the fed paper size is longer than the specified value during duplex printing.	■ Reset the incorrectly ejected paper and push the Release error key to continue. ■ By pressing the Release error key, feeds the paper and continue the procedure if the paper feeding is success. ■ By pressing the Stop key, it cancels error display and cancels print data and returns from error status.

Note : For more information on the remedies, see "2.1.1 Troubleshooting according to Error Messages" *(p.8)*.

CHAPTER

2

TROUBLESHOOTING

2.1 Overview

This chapter describes unit-level troubleshooting.

2.1.1 Troubleshooting according to Error Messages

After checking the printer LED and STM3 error indications, you can grasp the fault location using the check list in this section. When you find the fault location, refer to Chapter 3 “Disassembly and Reassembly” and change the corresponding part and/or unit. The following table indicates the check point reference tables corresponding to the error states (LED and STM3).

Table 2-1. List of Error Messages

Error Status	LED Indications			See the table for Troubleshooting
	Power	Paper	Ink	
Paper out error	-	Light	-	Refer to Table 2-3 “Troubleshooting of Paper Out Error” *(P.11)*
Paper jam error	-	Flash	-	Refer to Table 2-4 “Troubleshooting of Paper Jam Error” *(P.13)*
Multi-feed error	-	Light	-	Refer to Table 2-5 “Troubleshooting of Multi-feed error” *(P.14)*
Maintenance request	Off	Flashes alternately 1	Flashes alternately 2	Refer to Table 2-6 “Troubleshooting of Maintenance Request” *(P.14)*
Fatal error	Off	Flashes at high speed	Flashes at high speed	Refer to Table 2-7 “Troubleshooting of Fatal Error” *(P.15)*

Note : --: No change
Flash: Repeats turning On and Off every 1.25 seconds.
Flash at high speed: Repeats turning On and Off every 0.5 seconds.
Flashes alternately 1: Same as the “Flash”
Flashes alternately 2: Repeats turning Off and On every 1.25 seconds.

Table 2-2. Troubleshooting of Communication Error

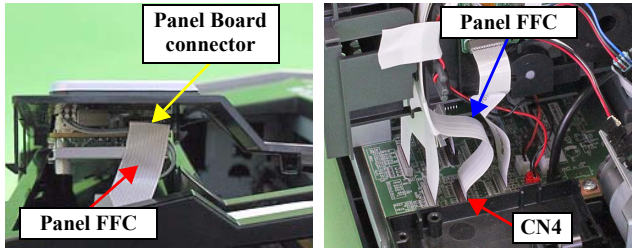
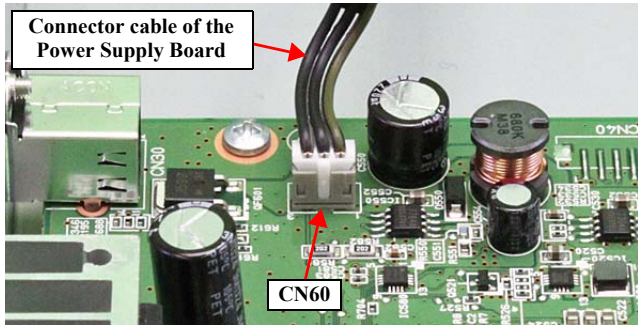
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The printer does not operate at all.	Panel FFC	1. Check that the Panel FFC is connected to the Panel Board connector and Main Board connector CN4. 	1. Connect the Panel FFC to the Panel Board and Main Board connectors.
			2. Check the Panel FFC for damages.	2. Replace the Panel FFC with a new one.
		Panel Board	1. Check the Panel Board for damages.	1. Replace the Panel Board with a new one.
		Power Supply Board	1. Check that the connector cable of the Power Supply Board is connected to the Main Board connector CN60. 	1. Connect the connector cable of the Power Supply Board to the Main Board connector CN60.

Table 2-2. Troubleshooting of Communication Error

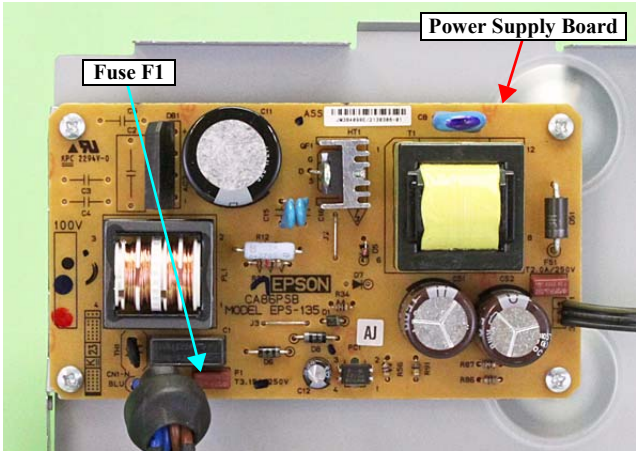
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The printer does not operate at all.	Power Supply Board	2. Check that the Fuse F1 on the Power Supply Board has not blown. 	2. Replace the Power Supply Board with a new one.
			3. Check the components on the Power Supply Board for damage.	3. Replace the Power Supply Board with a new one.
At operation	Operation at power-on is normal, but the error appears when the print job is sent to the printer.	Interface cable	1. Check that the Interface cable is connected between the PC and printer.	1. Connect the Interface cable to the PC and printer.
			2. Check the Interface cable for breaking.	2. Replace the Interface cable with a new one.
		USB	1. Check that the PC and printer are connected via the USB hub.	1. Configure the USB ID setting. Refer to Chapter 4 “Adjustment”.
		Printer Driver	1. Check that the printer driver for L1800 has already been installed.	1. Install the printer driver for L1800.
			2. Check that the connected printer is L1800.	2. Connect the L1800 printer.
		Main Board	1. Check that a wrong model name has not been input to the EEPROM on the Main Board.	1. Make the initial setting using the Adjustment Program. Refer to Chapter 4 “Adjustment”.

Table 2-3. Troubleshooting of Paper Out Error

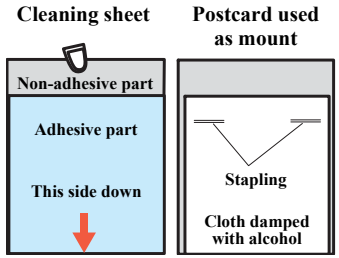
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	When the Paper Switch is pressed, the LD Roller attempt to feed paper but the paper is not fed.	ASF Assy.	1. Check the LD Roller or Retard Roller of the ASF Assy for paper dust and foreign matter.	1. Using a cleaning sheet, clean the LD Roller and Retard Roller. The procedure is as follows. (1) Place the cleaning sheet upside down and put it into the ASF Assy. (2) Press the Paper Switch to start paper feed. (3) Repeat the above steps several times. * To remove persistent contamination, staple an alcohol-dampened cloth to a postcard and clean the rollers in the following method.  (1) Place the alcohol-dampened cloth toward the LD Roller surface of the ASF Assy. (2) Hold the mount top end securely and press the Paper Switch. (3) Repeat the paper feed sequence several times to clean the LD Roller surface of the ASF Assy.

Table 2-3. Troubleshooting of Paper Out Error

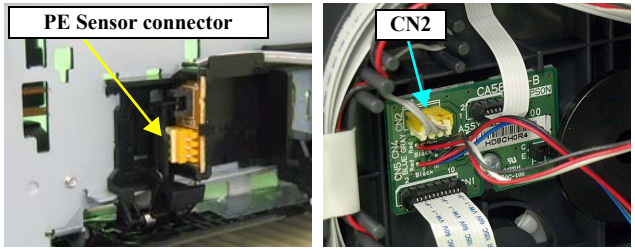
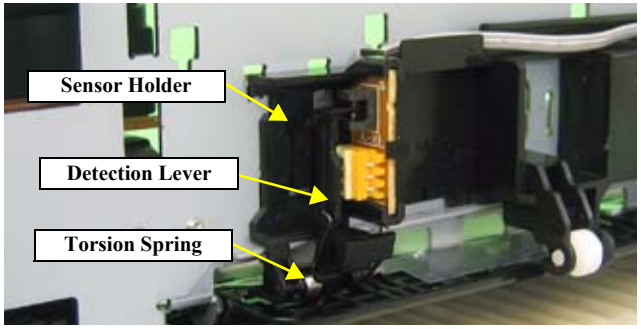
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	Paper Mismatch Error is indicated.	PE Sensor	1. Check that the connector cable of the PE Sensor is securely connected to the PE Sensor and Relay Board connector CN2. 	1. Connect the connector cable of the PE Sensor to the PE Sensor and connector CN2 on the Relay Board correctly.
			2. Check that the Sensor Holder is mounted to the Mechanical frame correctly. 	2. Install the Sensor Holder correctly.
			3. Move the Detection Lever manually as when the paper passes, and check that the Detection Lever returns to the original position automatically by the Torsion Spring when released. Refer to the above photo.	3. Replace the PE Sensor Holder Unit with a new one.
			4. Using a tester, check that the PE Sensor is normal. · Paper absent : 2.4V or more · Paper present : 0.4V or less	4. Replace the PE Sensor Holder Unit with a new one.

Table 2-4. Troubleshooting of Paper Jam Error

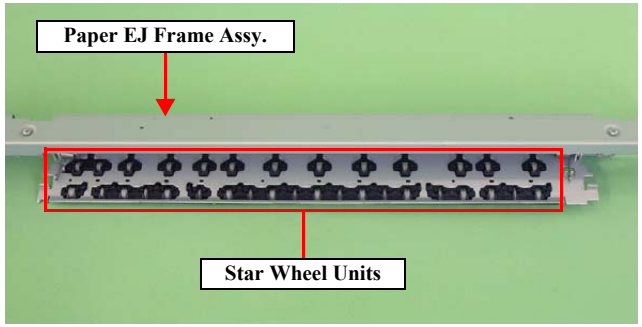
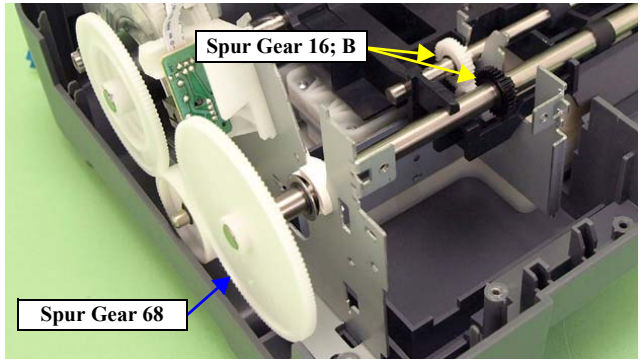
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At operation	At the time of paper ejection, the PF Roller advances the paper but cannot eject it completely.	–	1. Check that the size of the fed paper is not larger than that of the paper specified by the driver.	1. Tell the user that the paper size specified by the driver is not available for the printer.
	Paper is not ejected completely and causes a jam near the Paper Eject Frame.	ASF Assy.	1. Check that the paper is fed along the Right Edge Guide.	1. Feed the paper along the Right Edge Guide.
		Paper EJ Frame Assy.	1. Check that the Star Wheel Units have not come off the Paper EJ Frame Assy.  	1. Securely install the Star Wheel Units to the Paper EJ Frame Assy.
			2. Check the Paper EJ Frame Assy for deformation or damages.	2. Replace the Paper EJ Frame Assy with a new one.
		Spur Gear 68 Spur Gear 16; B Paper EJ Roller Assy.(front/rear)	1. Check the Spur Gear 68 or Spur Gear 16; B for damages.  	1. Replace the Front (or Rear) Paper EJ Roller Assy with a new one.

Table 2-5. Troubleshooting of Multi-feed error

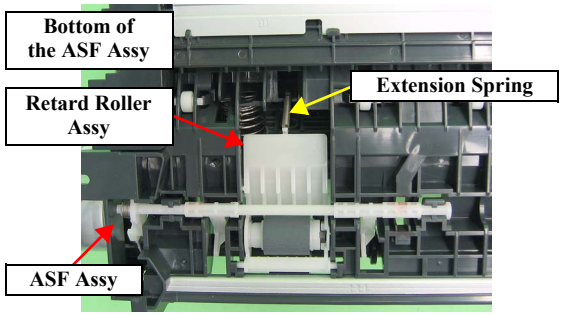
Occurrence Timing	Phenomenon Detail	Faulty Part/Part Name	Check Point	Remedy
Any time	During manual double-sided printing, multiple sheets are fed at a time.	ASF Assy	1. Check that the Retard Roller Assy is moving properly during the feeding operation.  	1. Attach the Extension Spring on the back side of the Retard Roller Assy correctly. Refer to Chapter 3 Retard Roller Assy *(P.76)*.
			2. Check that the position of the ASF Guide Roller LDs has been adjusted correctly.	2. Adjust the position of the ASF Guide Roller LDs. Refer to Chapter 3 ASF Assy *(P.71)*.

Table 2-6. Troubleshooting of Maintenance Request

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the printer does not operate at all.	Waste Ink Pads	1. Using the Adjustment Program, check if the values of the Protection Counter A and B have exceeded the threshold value.	1. Replace the Waste Ink Pads and reset the Protection Counter A and B value with the Adjustment Program.

Table 2-7. Troubleshooting of Fatal Error

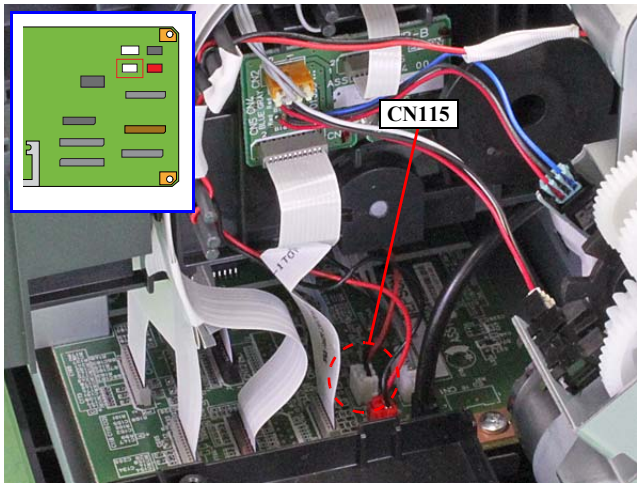
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the CR Motor does not operate at all.	CR Motor	1. Check the CR Motor connector cable for damages.	1. Replace the CR Motor with a new one.
			2. Check if the CR Motor operates normally.	2. Replace the CR Motor with a new one.
			3. Check that the CR Motor connector cable is connected to the Main Board connector CN115. 	3. Connect the CR Motor connector cable to the Main Board connector CN115.

Table 2-7. Troubleshooting of Fatal Error

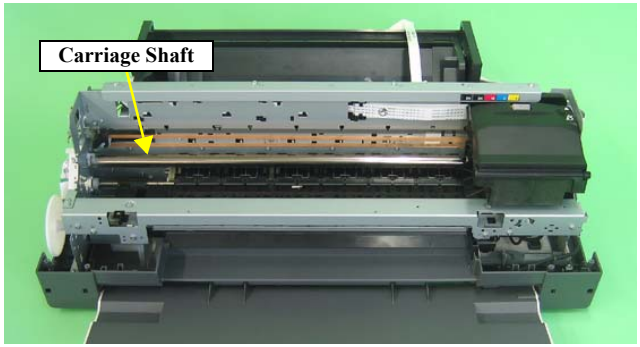
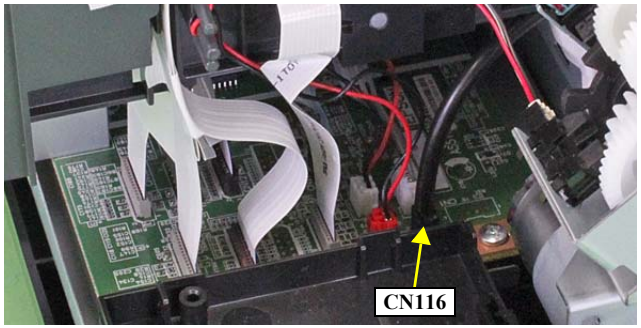
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	The power-on sequence is executed but Fatal error is displayed.	CR drive mechanism	1. Check that the Carriage Shaft is lubricated with grease. 	1. Wipe the surface of the Carriage Shaft with a dry, soft cloth, and lubricate the Carriage Shaft with grease G-71. Refer to Chapter 5 "Maintenance".
	At power-on, the PF Motor does not operate at all.	PF Motor	1. Check that the connector cable of the PF Motor is connected to the Main Board connector CN116. 	1. Connect the PF Motor connector cable to the Main Board connector CN116.
			2. Check the PF Motor connector cable for damages.	2. Replace the PF Motor with a new one.
			3. Check if the PF Motor operates normally.	3. Replace the PF Motor with a new one.

Table 2-7. Troubleshooting of Fatal Error

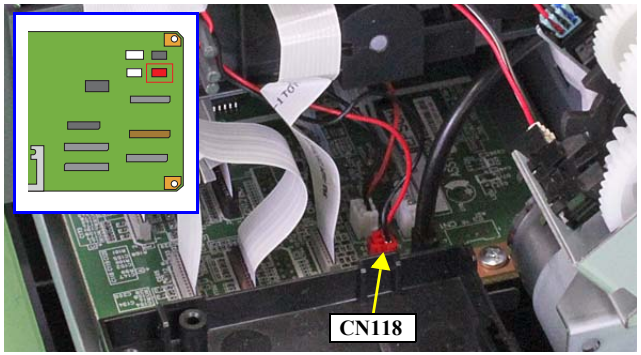
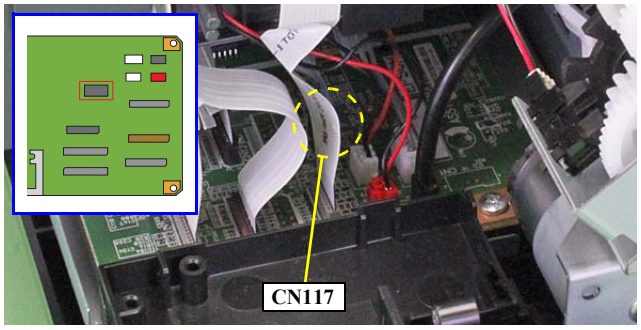
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the APG Motor does not operate at all.	APG Motor	1. Check that the connector cable of the APG Motor is connected to the Main Board connector CN118.  	1. Connect the APG Motor connector cable to the Main Board connector CN118.
			2. Check the APG Motor connector cable for damage.	2. Replace the APG Assy with a new one.
			3. Check if the APG Motor operates normally.	3. Replace the APG Assy with a new one.
	At power-on, the Pump Motor does not operate at all.	Pump Motor	1. Using a tester, check the resistance value of the Pump Motor. Value of resistance: 10.3 Ω ± 10%	1. If the resistance value is abnormal, replace the Ink System with a new one.
			2. Check the Pump Motor connector cable for damages.	2. Replace the Ink System with a new one.
			3. Check that the Pump Motor connector cable is connected to the Main Board connector CN117.  	3. Connect the Pump Motor connector cable to the Main Board connector CN117.
			4. Check the Pump Motor connector cable for damages.	4. Replace the Ink System with a new one.

Table 2-7. Troubleshooting of Fatal Error

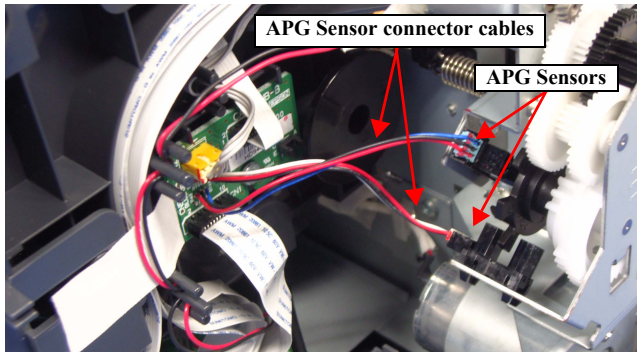
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	While the power-on sequence is being executed, Fatal error is displayed.	APG Sensor	1. Check the APG Sensor connector cables is connected to the APG Sensor connectors. 2. Check if the connector cables of the APG Sensor is broken. 	1. Connect the APG Sensor connector cables to the APG Sensor connectors. 2. Replace the ASF Assy with a new ones.
			3. Check the APG Sensors for damages.	3. Replace the APG Assy with a new one.

Table 2-7. Troubleshooting of Fatal Error

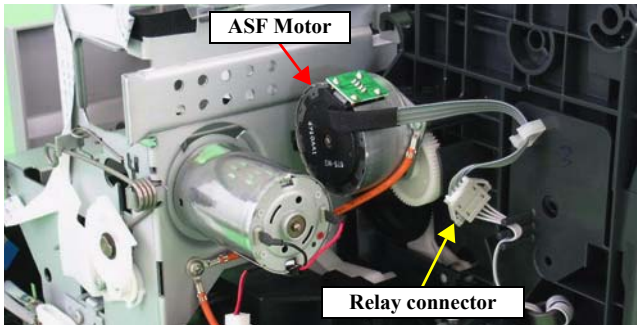
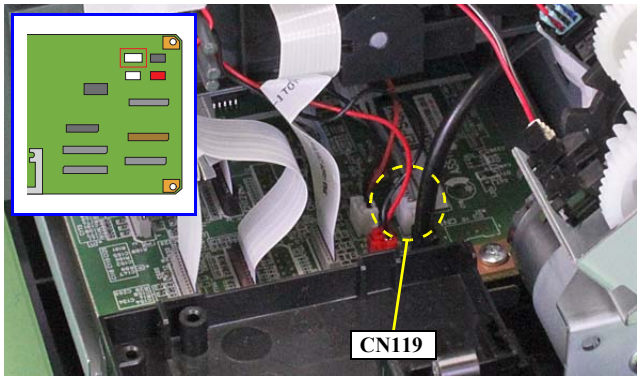
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	While the power-on sequence is being executed, Fatal error is displayed.	ASF Motor	1. Check that the connector cable of the ASF Motor is connected to the Relay connector.  	1. Connect the connector cable of the ASF Motor to the Relay connector.
			2. Using a tester, check the resistance value of the ASF Motor. Value of resistance: 7.0 Ω ± 10%	2. If the resistance value is abnormal, replace the ASF Motor with a new one.
			3. Check the ASF Motor connector cable for damages.	3. Replace the ASF Motor with a new one.
		Relay connector cable	1. Check that the Relay connector cable is connected to the Main Board connector CN119.  	1. Connect the Relay connector cable to the Main Board connector CN119.
			2. Check the Relay connector cable for damages.	2. Replace the Relay connector cable with a new one.

Table 2-7. Troubleshooting of Fatal Error

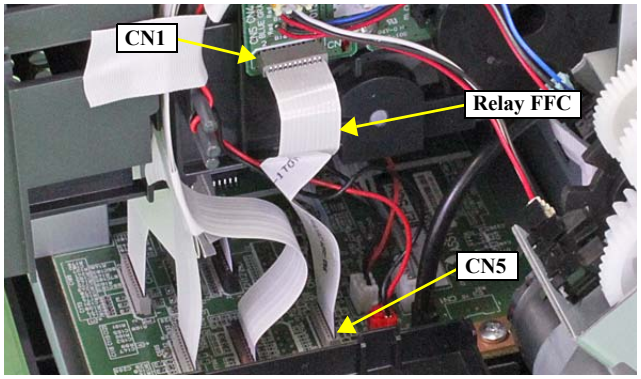
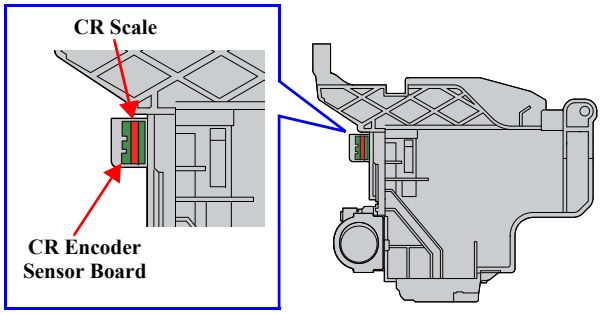
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	While the power-on sequence is being executed, Fatal error is displayed.	Relay FFC	1. Check that the Relay FFC is connected to the Relay Board connector CN1 and Main Board connector CN5. 	1. Connect the Relay FFC to the Relay Board connector CN1 and Main Board connector CN5.
			2. Check the Relay FFC for damages.	2. Replace the Relay FFC cable with a new one.
	At power-on, the Carriage Unit moves away from the home position and bumps against the right of the Frame, then hits the left of the Frame.	CR Scale	1. Check that the CR Scale is inserted in the slit of the CR Encoder Sensor. 	1. Insert the CR Scale into the slit of the CR Encoder Sensor.
			2. Check the CR Scale for damages and dirt.	2. Wipe off the dirt completely or replace the CR Scale with a new one.
		CR Encoder Sensor Board	1. Check the CR Encoder Sensor for paper dust, etc.	1. Remove the paper dust, etc. from the CR Encoder Sensor.
			2. Check the CR Encoder Sensor Board for damages.	2. Replace the CR Encoder Sensor Board with a new one.

Table 2-7. Troubleshooting of Fatal Error

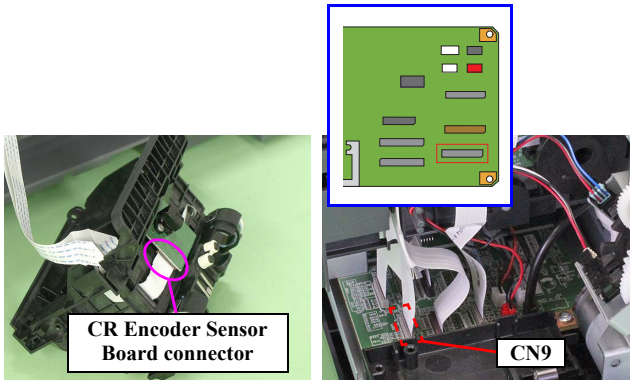
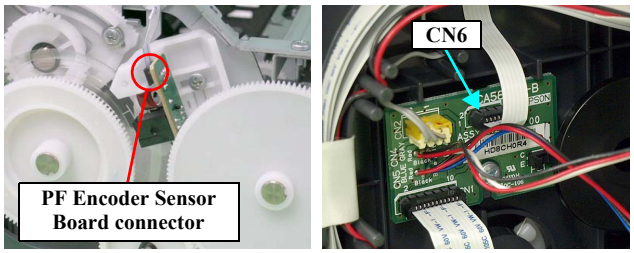
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the Carriage Unit moves away from the home position and bumps against the right of the Frame, then hits the left of the Frame.	Sensor FFC	1. Check that the Sensor FFC is connected to the CR Encoder Sensor Board connector and Main Board connector CN9. 	1. Connect the Sensor FFC to the CR Encoder Sensor Board connector and Main Board connector CN9.
			2. Check the Sensor FFC for damages.	2. Replace the Sensor FFC with a new one.
	At power-on, the PF Roller rotates fast about a half turn.	PF Encoder Sensor Holder	1. Check that the PF Encoder Sensor Holder is mounted correctly.	1. Install the PF Encoder Sensor Holder correctly.
			2. Check that the FFC of the PF Encoder Sensor is securely connected to the PF Encoder Sensor Board connector and Relay Board connector CN6. 	2. Connect the PF Encoder Sensor FFC to the PF Encoder Sensor Board and Relay Board connector CN6.
			3. Check the PF Encoder Sensor for paper dust, etc.	3. Remove the paper dust, etc. from the PF Encoder Sensor.
			4. Check if the PF Encoder or the FFC is damaged.	4. Replace the PF Encoder with a new one.

Table 2-7. Troubleshooting of Fatal Error

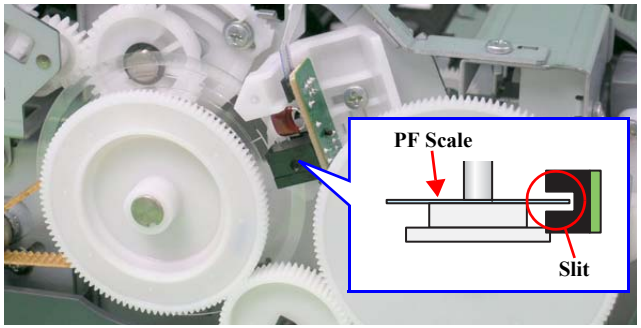
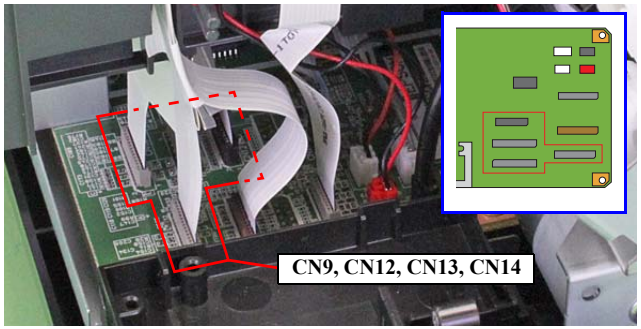
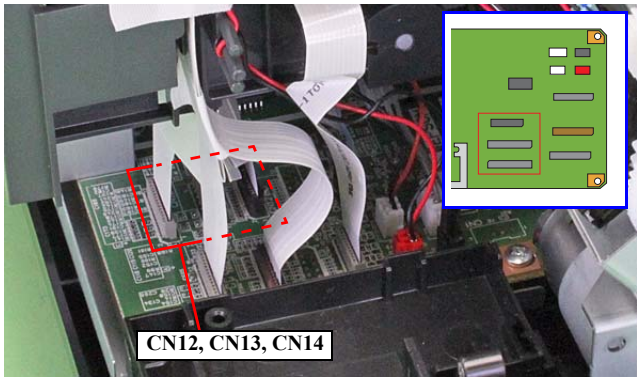
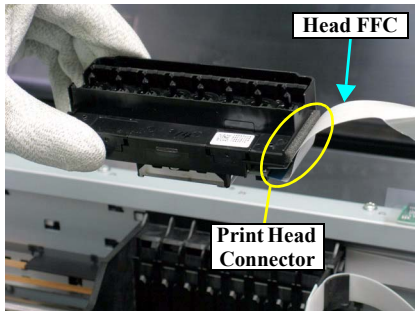
Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
At power-on	At power-on, the PF Roller rotates fast about a half turn.	PF Scale	1. Check that the PF Scale is inserted in the slit of the PF Encoder Sensor. 	1. Install the PF Scale in the slit of the PF Encoder Sensor correctly.
			2. Check the PF Scale for damages and dirt.	2. Replace the PF Scale with a new one.
During printing	After receiving a print data, an error is displayed on the LED and STM3.	Head FFC Sensor FFC	1. Check that the Head FFC and the Sensor FFC are securely connected to the Main Board connectors CN9, CN12, CN13, and CN14. 	1. Connect the Head FFC and the Sensor FFC to the Main Board connectors CN9, CN12, CN13, and CN14.

Table 2-7. Troubleshooting of Fatal Error

Occurrence Timing	Phenomenon Detail	Faulty Part/ Part Name	Check Point	Remedy
During printing	After starting to print, ink is not ejected and paper stops midway.	Head FFC	1. Check that the Head FFC is securely connected to the Main Board connectors CN12, CN13, and CN14.  	1. Connect the Head FFC to the Main Board connectors CN12, CN13, and CN14.
			2. Check the Head FFC for damages.	2. Replace the Head FFC with a new one.
		Head FFC	1. Check that the Head FFC is securely connected to the Print Head connectors.  	1. Connect the Head FFC to the CR Relay Board connectors CN1 and CN2. 2. Connect the Head FFC to the Print Head connectors.
			2. Check the Head FFC for damages.	3. Replace the Head FFC with a new one.
	Ink is not ejected from most nozzles.	Print Head	1. Check for occurrence of Head Hot.	1. Replace the Print Head with a new one.

2.1.2 Troubleshooting based on Observed Faults

This section provides troubleshooting procedures based on observed faults such as print quality troubles and abnormal noise.

Table 2-8. Print Quality Troubles

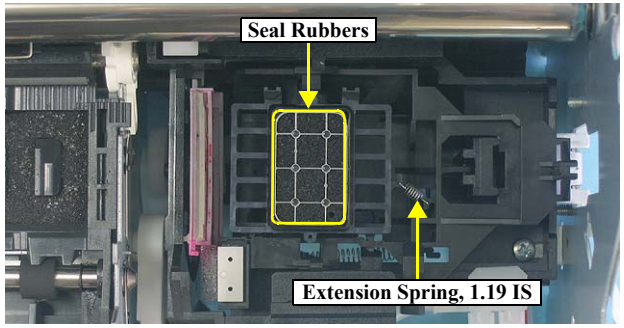
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors	Inks are not ejected from the Print Head to the Cap.	Ink System Unit (Cap)	1. Check for foreign matter around the Seal Rubber on the Cap Unit.  	1. Remove the foreign matter around the Seal Rubber completely.
			2. Check that the Extension Spring 1.19 IS is correctly installed to the Cap Unit.	2. Replace the Ink System Unit with a new one.
	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle.	Print Head	1. Run a Nozzle Check, and check the printed pattern if it has broken lines or missing segments.	1. After running a Head Cleaning, check the Nozzle Check Pattern again.

Table 2-8. Print Quality Troubles

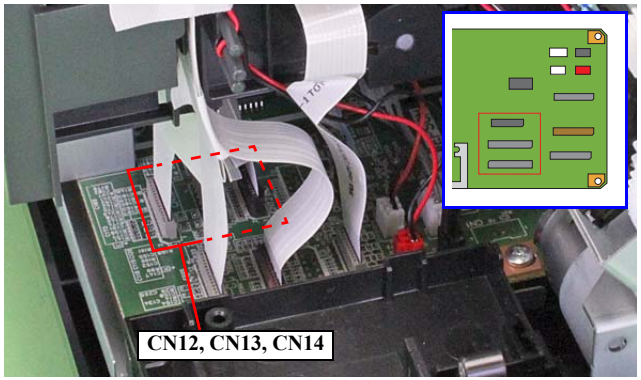
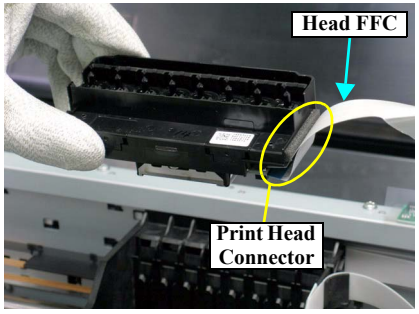
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle.	Head FFC	1. Check that the Head FFC is securely connected to the Main Board connectors CN12, CN13, and CN14.  	1. Connect the Head FFC to the Main Board connectors CN12, CN13, and CN14.
			2. Check the Head FFC for damages.	2. Replace the Head FFC with a new one. If the trouble still occurs after replacing it, replace the Print Head with a new one.
		Head FFC	1. Check that the Head FFC is securely connected to the Print Head connectors.  	1. Connect the Head FFC to the CR Relay Board connectors CN1 and CN2. 2. Connect the Head FFC to the Print Head connectors.
			2. Check the Head FFC for damages.	3. Replace the Head FFC with a new one. If the trouble still occurs after replacing it, replace the Print Head with a new one.

Table 2-8. Print Quality Troubles

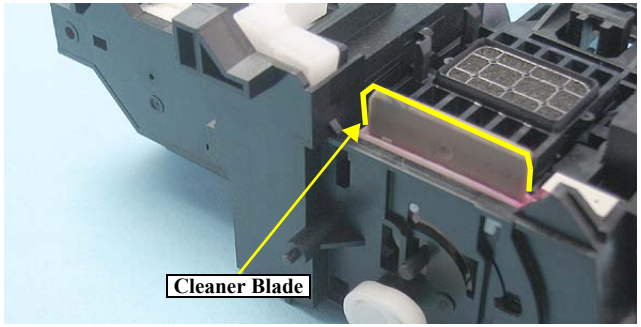
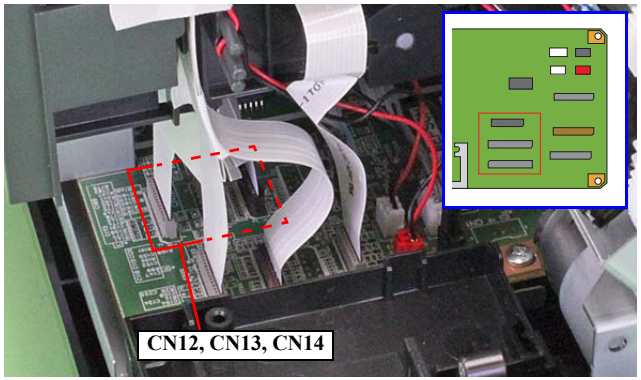
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Dot missing and mixed colors	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle.	Ink System Unit Cleaner Blade	1. Check if the Cleaner Blade is covered with paper dust or is bent. 	1. Replace the Ink System Unit with a new one.
		Main Board	1. Check the Main Board for damages.	1. Replace the Main Board with a new one.
Horizontal or vertical banding / Getting smeared	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle.	Head FFC	1. Check that the Head FFC is securely connected to the Main Board connectors CN12, CN13, and CN14. 	1. Connect the Head FFC to the Main Board connectors CN12, CN13, and CN14.
			2. Check the Head FFC for damages.	2. Replace the Head FFC with a new one. If the trouble still occurs after replacing it, replace the Print Head with a new one.

Table 2-8. Print Quality Troubles

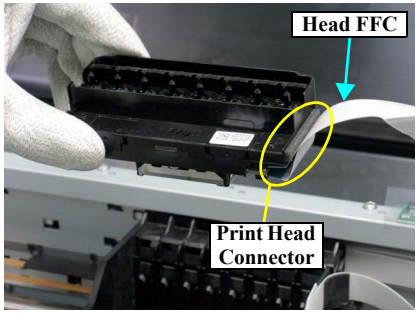
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Horizontal or vertical banding / Getting smeared	Although inks are ejected from the Print Head to the Cap, the trouble still occurs after executing a cleaning cycle.	Head FFC	1. Check that the Head FFC is securely connected to the Print Head connectors.  	1. Connect the Head FFC to the CR Relay Board connectors CN1 and CN2. 2. Connect the Head FFC to the Print Head connectors.
			2. Check the Head FFC for damages.	3. Replace the Head FFC with a new one. If the trouble still occurs after replacing it, replace the Print Head with a new one.
		Print Head	1. Check if the print quality recovers after running a cleaning.	1. Run the cleaning several times. If the trouble still occurs, replace the Print Head with a new one.
		Main Board	1. Check the Main Board for damages.	1. Replace the Main Board with a new one.

Table 2-8. Print Quality Troubles

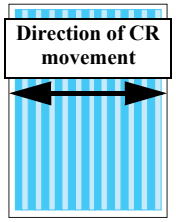
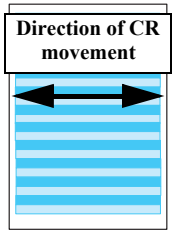
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Vertical or horizontal banding / Color shading	The printout has banding vertical to the CR moving direction and is not evenly colored.  * If the trouble still occurs after doing all measures described in the right-hand columns, replace the CR Motor with a new one.	Adjustment	1. For printing in the Bi-D mode, check that the Bi-D Adjustment has been performed properly.	1. Perform Bi-D Adjustment to eliminate displacements between the upper and lower lines. Refer to Chapter 4 "Adjustment".
		Print Head	1. Run a Nozzle Check, and check the printed pattern if it has broken lines or missing segments.	1. Perform the Head Cleaning, then check the Nozzle Check Pattern. Refer to Chapter 4 "Adjustment". If the trouble still occurs, replace the Print Head with a new one.
		Carriage Shaft	1. Check the surfaces of the Carriage Shaft for foreign matter.	1. Remove foreign matter from the Carriage Shaft.
			2. Check that the Carriage Shaft is fully lubricated with grease.	2. Wipe the grease applied to the Carriage Shaft with a dry, soft cloth, and then apply G-71 grease. Refer to Chapter 5 "Maintenance".
			3. Check that the Carriage Shaft is mounted horizontally.	3. Reassemble the Carriage Shaft correctly.
			4. Check the Carriage Shaft for damages.	4. Replace the Carriage Shaft with a new one.
	Narrow stripes of the same width appear horizontally to the CR moving direction.  * If the trouble still occurs after doing all measures described in the right-hand columns, replace the PF Motor with a new one.	Printer Driver and the Paper	1. Check if appropriate paper is used in accordance with the Printer Driver settings.	1. Use the appropriate type of paper in accordance with the Printer Driver.
		Print Head	1. Run a Nozzle Check, and check the printed pattern if it has broken lines or missing segments.	1. Perform the Head Cleaning, then check the Nozzle Check Pattern. Refer to Chapter 4 "Adjustment". If the trouble still occurs, replace the Print Head with a new one.
		PF Roller Shaft	1. Check the surface of the PF Roller Shaft for foreign matter.	1. Clean the PF Roller surface carefully.
			2. Check the PF Roller Shaft for damages.	2. Replace the PF Roller with a new one.

Table 2-8. Print Quality Troubles

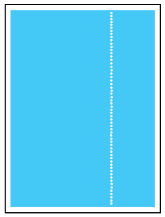
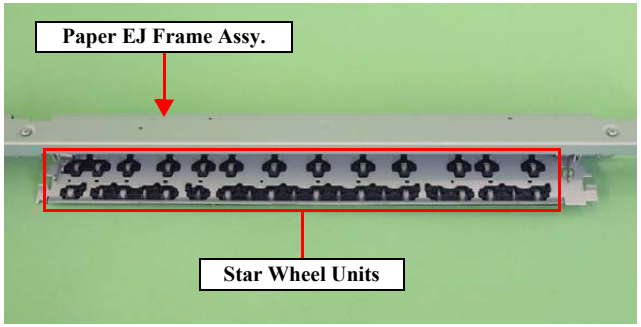
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Vertical or horizontal banding / Color shading	When printing at 360 dpi, horizontal banding and color unevenness appears at a constant frequency.	Adjustment	1. Check that PF Adjustment has executed properly.	1. Perform PF Adjustment properly. Refer to Chapter 4 "Adjustment".
			2. Check for Dot missing.	2. Replace the Ink System Unit with a new one.
	Star Wheel Rollers traces appear in the CR moving direction. 	Paper EJ Frame Assy.	1. Check that the Star Wheel Units have not come off or the Star Wheel Rollers turns normally. 	1. Install the Star Wheel Units to the Paper EJ Frame Assy correctly.
	Printout is faint or blurry.	Printer Driver and the Paper	1. Check that adequate paper is used according to the setting of the Printer Driver.	1. Use the appropriate type of paper in accordance with the Printer Driver.
		Print Head	1. Using the Adjustment Program, check that the correct Head ID has been written to the EEPROM.	1. Using the Adjustment Program, enter the 24-digits code of the Head ID to the EEPROM. Refer to Chapter 4 "Adjustment".
	The bottom of the printout is not evenly colored.	Adjustment	1. Check if the Positioning Adjustment of PF Roller Shaft Retainer has been performed properly.	1. Make adjustments according to the specified adjustment priority. Refer to Chapter 4 "Adjustment".
Paper EJ Roller traces appear on the printout.	Traces of the Paper EJ Roller appear on the printed paper.	Printer Driver and the Paper	1. Check if appropriate paper is used in accordance with the Printer Driver settings.	1. Use the appropriate type of paper in accordance with the Printer Driver.
		Front and Rear Paper EJ Roller Assys.	1. Check if the Paper EJ Roller is clean or not.	1. Clean the Paper EJ Roller with a soft cloth.

Table 2-8. Print Quality Troubles

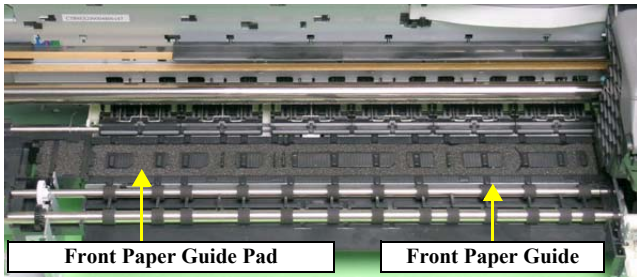
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
The printout is stained with ink.	The non-printed side or the bottom of the printout is dirty with ink.	Front Paper Guide Pad	1. Check that heaps of ink are not formed on the Front Paper Guide Pad and that the Front Paper Guide Pad is installed securely and evenly in the setting position. 	1. If heaps of ink are formed, replace the Front Paper Guide. If it has been confirmed that the Ink pads have risen, reinstall the Front Paper Guide Pad correctly.
	When the paper size in the sent print data is larger than the size of the fed paper, data are printed on the Front Paper Guide, extending off the paper.	PW sensor	1. Check that the PW Sensor FFC is connected.	1. Connect the PW Sensor FFC.
			2. Check that the PW Sensor is not faulty.	2. Replace the PW Sensor with a new one.
	Ink smudges appear on the blank area of the printout.	Paper EJ Frame Assy.	1. Check the Star Wheel Rollers for ink stain.	1. Clean the Star Wheel Rollers with a soft cloth.
		Front Paper Guide	1. Check the Front Paper Guide for ink stain.	1. Clean the Front Paper Guide with a soft cloth.
		Front Paper Guide Pad	1. Check if ink heaps are formed on the Front Paper Guide Pad.	1. Replace the Front Paper Guide with a new one.

Table 2-8. Print Quality Troubles

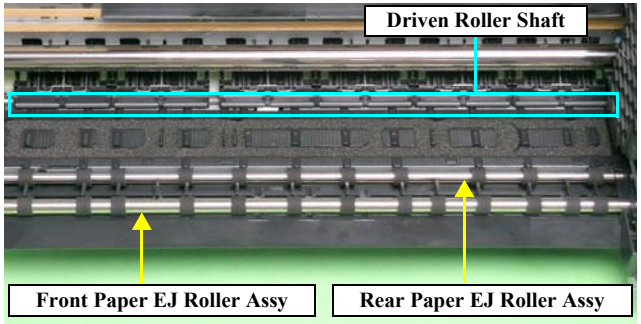
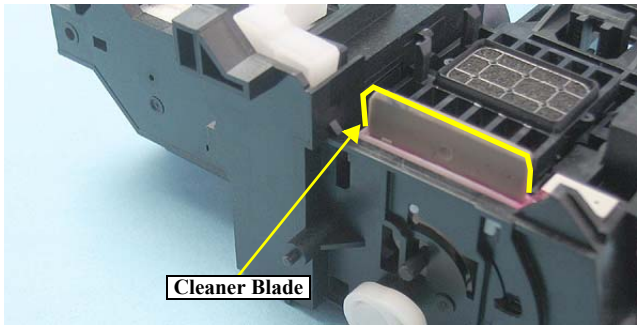
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
The printout is stained with ink.	Ink smudges appear on the blank area of the printout.	Front and Rear Paper EJ Roller Assys	1. Check the Front and Rear Paper EJ Roller Assys for ink stain. 	1. Clean the Front and Rear Paper EJ Roller Assys with a soft cloth.
		Driven Roller Shaft	1. Check the Driven Roller Shaft for ink stain.	1. Clean the Driven Roller Shaft with a soft cloth.
		Ink System Unit	1. Check that wiping operation was performed properly. 	1. Install the Cleaner blade correctly or replace it with a new one.

Table 2-8. Print Quality Troubles

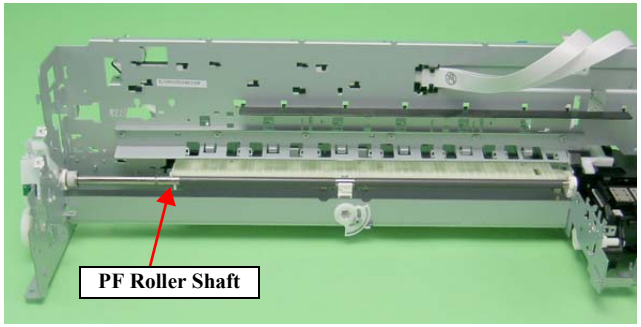
Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
The printout is stained with ink.	Ink smudges appear on the blank area of the printout.	PF Roller Shaft	1. Check the PF Roller Shaft for ink stain. 	1. Clean the PF Roller Shaft with a soft cloth.
The printout is grainy.	Images are printed grainy in all print modes. Or the image looks rough.	Adjustment Main Board Print Head	1. Check that PG, Bi-D and Head Angular Adjustments have been made properly.	1. Make the adjustments according to the specified adjustment priority. Refer to Chapter 4 "Adjustment".
			2. Print the adjustment check patterns and check if they are grainy.	2. If the images look still grainy after adjustment, replace the Main Board with a new one.
	When printed at 5760 dpi, the printed images are poor or grainy.	Adjustment Main Board Print Head	1. After making sure that PG, Bi-D and Head Angular Adjustments have been made correctly, check whether PW Sensor has been adjusted properly.	1. Make the adjustment according to the specified adjustment priority. Refer to Chapter 4 "Adjustment".
			2. Print the adjustment check patterns and check if the printed images are still poor or grainy.	2. If the image quality does not improve after the adjustment, replace the Print Head and Main Board in this order, and check the image graininess.
Regarding hue of images	The whole image is reddish.	Adjustment Print Head	1. Check if the PG has been adjusted properly.	1. Make the adjustment according to the specified adjustment priority. Refer to Chapter 4 "Adjustment".
			2. Check that Bi-D and Head Angular Adjustments have been made properly.	2. Make the adjustments according to the specified adjustment priority. Refer to Chapter 4 "Adjustment".
			3. Print the adjustment check patterns and check the image color.	3. If the image color does not change after adjustment, replace the Print Head with a new one.

Table 2-8. Print Quality Troubles

Observed Faults	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
Borderless Printing	Cannot make a borderless printing (The printer prints with margins despite the borderless setting).	PW sensor	1. Check if the paper dust or scrap of the paper is attached to the Front Paper Guide.	1. Remove the paper dust or scrap of the paper.
			2. Check that PW adjustment has executed properly.	2. If the borderless printing still can not be made after the adjustment, replace the PW Sensor with a new one. Refer to Chapter 4 "Adjustment".
Pattern misalignment for vertical lines and such	The vertical lines are not aligned at monochrome draft printing.	Adjustment	1. Check that BAND printing adjustment has executed properly.	1. Make the adjustment according to the specified adjustment priority. Refer to Chapter 4 "Adjustment".
Blank print	Inks are not ejected from Print Head even though Carriage moves and paper is fed.	Valve (Valve Lever)	1. Check that Valve of Ink Tank opens.	1. Open Valve.
		Ink Tube	1. Check that Ink Tubes are not crumpled.	1. Release crumpled Ink Tube.
		Adapter Ink Tube Tube Joint Ink Supply Tank	1. Check that Ink Tube connections are complete.	1. Reassemble Ink Tubes and compete their connections.

Table 2-9. Abnormal Noise

Occurrence Timing	Details of the Fault	Faulty Part/ Part Name	Check Point	Remedy
–	Printing operation is performed normally but abnormal noise is produced at power-on or during operations.	Adjustment	1. Check that PF Belt Tension Adjustment has been executed properly.	1. Make the adjustment according to the specified adjustment priority. Refer to Chapter 4 "Adjustment".
		Carriage Shaft	1. Check that the Carriage Shaft is fully lubricated with grease.	1. Wipe the grease applied to the Carriage Shaft with a dry, soft cloth, and then apply grease (G-71). Refer to Chapter 5 "Maintenance".

CHAPTER

3

DISASSEMBLY AND ASSEMBLY

3.1 Overview

This chapter describes procedures for disassembling and assembling this product. Unless otherwise specified, the disassembled units or main components can be reassembled by reversing the disassembling procedure.

- ☐ WARNINGs must be followed to avoid personal injury or death.
- ☐ CAUTIONs must be followed to avoid damaging the printer or test equipment.
- ☐ ADJUSTMENT REQUIRED indicates that specific mandatory adjustments must be carried out to complete the repair.
- ☐ CHECK POINTs emphasize a particularly important process or procedure.
- ☐ REASSEMBLY notes provide helpful tips on reassembly procedures, especially when correct reassembly differs from simple reverse-assembly.

Before starting your work, always read the precautions described in the next section.

3.1.1 Precautions

Before starting the disassembling/reassembling work of this product, always read the following "WARNING" and "CAUTION" carefully.

- ■ **Before starting the disassembling/reassembling work of this product, always disconnect the power cable.**
  When the power supply cable must be connected for voltage measurement or like, be extremely careful not to get an electric shock and follow the procedures in this manual to do your work.
- ■ **Wear protective goggles to protect your eyes from ink. If ink gets in your eyes, wash your eyes with clean water and see a doctor.**
- ■ **To prevent injury from sharp metal edges, always wear gloves for disassembly and reassembly.**
- ■ **If ink has adhered to your skin, wash it with soap and water. If it has caused skin irritation, see a doctor.**
- ■ **To protect the microprocessors and circuitry, use static discharge equipment, such as anti-static wrist straps when accessing the internal components.**

- ■ **Use only the recommended tools for disassembly, reassembly and adjustment.**
  Refer to Table 3-1 "List of Tools".
- ■ **Tighten screws to the specified torques.**
- ■ **Use the specified lubricants and adhesives.**
  Refer to Chapter 5 "Maintenance".
- ■ **Make the necessary adjustments under the instructions given for disassembling.**
  Refer to Chapter 4 "Adjustment".
- ■ **When using compressed air products; such as air duster, for cleaning during repair and maintenance, the use of such products containing flammable gas is prohibited.**

3.1.2 Tools

The following table indicates the tools recommended for use for disassembly, reassembly and adjustment.

Table 3-1. List of Tools

Tool Name	Code
Phillips Screw Driver, No.1	1080530
Phillips Screw Driver, No.2	-
Flathead Screwdriver	-
Tweezers	-
Needle nose pliers	-
Nipper	-
Acetate tape	1003963
PF Tension Measuring Tool	1294120
Penlight	-
Strong tape	1032813

Note : All of the tools listed above are commercially available. EPSON provides the tools listed with EPSON tool code.

3.1.3 Screws

The following table lists the screws used in this product. When disassembling and reassembling the printer, refer to the following table and use the specified screws in the specified positions.

Table 3-2. List of Screw Types

No. Name	No. Name
1) C.B.P. M3x10	11) C.C. M3x4
2) C.B.S. M3x6	12) C.P.B. (P1) M1.7x5
3) C.B.S. (P2) M3x10	13) C.B.P. M2.6x5
4) C.B.P. M3x8	14) C.P. M3x4
5) C.B.S. M3x8	15) C.B.S. (P2) M3x8
6) C.B.S. (P4) M3x8	16) C.B.P. M2x8
7) C.B.P. M2.6x8	17) C.B. M3x6
8) C.B.S. (P4) M3x6	18) C.B.P. 3x12
9) C.B.P. M3x6	19) C.B. M3x4
10) C.B.S. M3x4	

3.1.4 Checks and Precautions before Disassembling

3.1.4.1 Factors which Affect the Print Quality

HOW TO PLACE THE INK TANK ASSY WHEN DISASSEMBLING/ REASSEMBLING

The Ink Supply Tank Assy of this printer has an air release hole on the upper part. The ink in the ink tanks is vented to the atmosphere through this hole to stabilize ink supply to the Printhead. If the Ink Supply Tank Assy is tilted, the ink in the tanks may leak from the air release hole. If the air release hole is sealed up with the leaked ink, ventilation to the atmosphere cannot be done properly and the print quality may be affected adversely.
In order to prevent this from happening, make sure to place the Ink Supply Tank Assy as shown below after removing it.

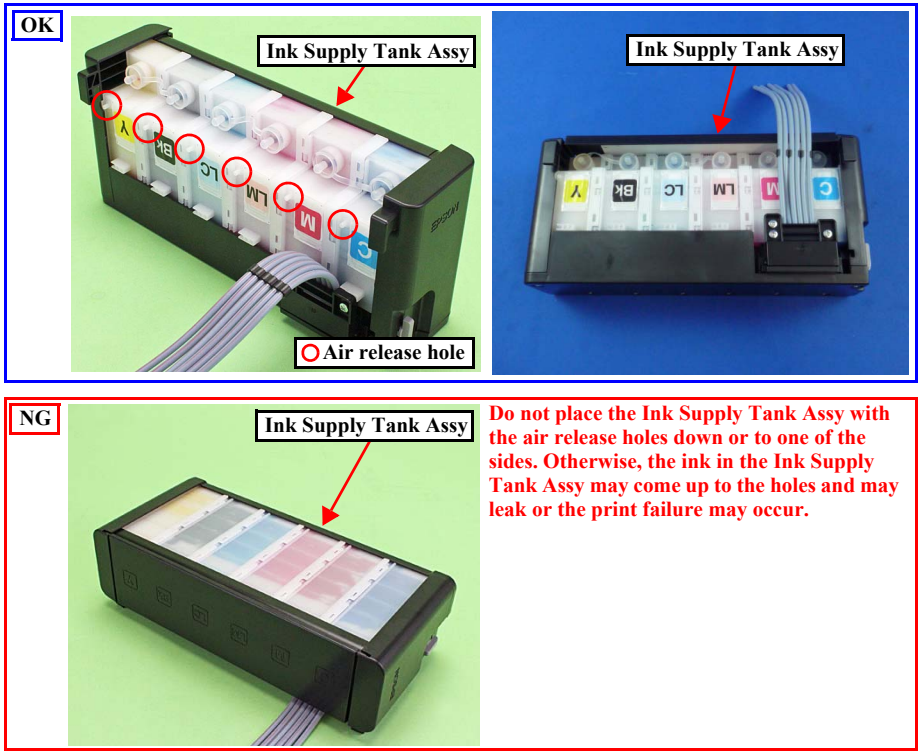


Figure 3-1. How to Place the Ink Tank Assy

3.1.4.2 Factors which Affect the Safety of Service Personnel such as Ink Leakage during Operation

Ink may spill when removing the following parts from L1800.
This section describes the parts that may cause ink spill and the means to minimize the ink spill when removing the parts.

THE PARTS THAT MAY CAUSE INK SPILL WHEN REMOVING

Parts	When ink may spill	Location
 Joint	Removing the Ink Supply Tank Tube Assy / Ink Supply Tube Assy from the Joint	A
 Ink Supply Tank Assy	☐ Removing the tubes of the Ink Supply Tank Tube Assy from the Joint ☐ Removing the tubes of the Ink Supply Tank Tube Assy from the Ink Supply Tank Assy	A, B
 Ink Supply Tank Tube Assy (w/Valve Assy)		
 Adapter	Removing the Ink Supply Tube Assy from the Adapter	C
 Ink Supply Tube Assy	☐ Removing the Ink Supply Tank Tube Assy / Ink Supply Tube Assy from the Joint ☐ Removing the Ink Supply Tube Assy from the Adapter	A, C

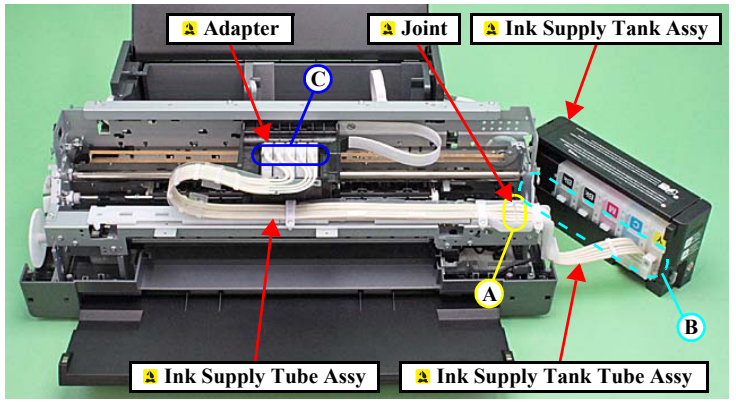


Figure 3-2. Location

MEANS DO TO MINIMIZE THE INK SPILL

CAUTION

Even observing the points described in this section, ink may spill in the following situations. Therefore, be careful not to contaminate the inside of the printer or its surroundings by preparing the container to receive the leaked ink, or the like.

- **When removing the Ink Supply Tank Tube Assy (w/Valve Assy), some ink will spill from both ends of the tube even the Valve Lever is closed.**
- **When removing the Ink Supply Tube Assy, all the ink in the tube will spill.**

Before disassembling, confirm that the printer is in the following condition.

☐ Choke Valve is closed

CAUTION

Do not turn the Valve Lever too much when closing the Choke Valve, otherwise, the Valve Lever and/or Valve Assy may get damaged.

- Before disassembling:
  Turn the Valve Lever and be sure to close the Choke Valve.
- After reassembling is complete:
  Open the Choke Valve to perform the print inspection.
- Before returning the printer to the user after repairing:
  Make sure to turn the Valve Lever up to the choke position to close the Choke Valve before packing the printer.

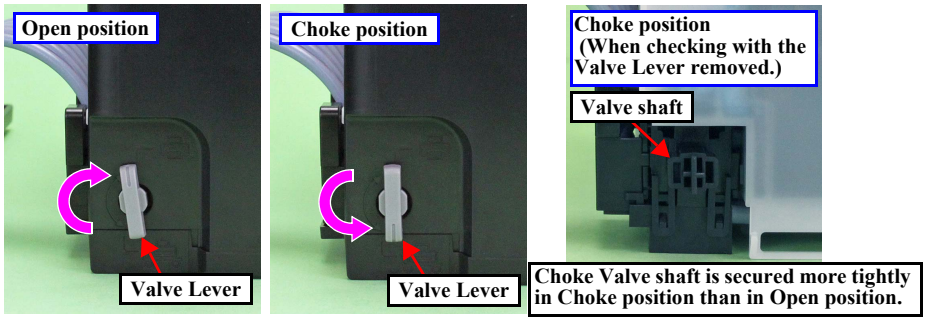


Figure 3-3. Opening/closing the Choke Valve

DISCHARGING INK FROM THE INK SUPPLY TANK

Discharging ink is recommended only when disconnecting the Ink Supply Tank Tube Assy from the Ink Supply Tank. Before performing the above disconnection, discharge ink from the Ink Supply Tank as follows.

- Necessary tools
  - Containers (x 6) for each discharged ink
  - Injector (with a tip of ϕ3.2 mm)
  - Tube (capable to be connected to the joint)

CHECK POINT

- **When disconnecting the Ink Supply Tube/Ink Supply Tank Tube from the Joint, ink may leak from the ink tube. Prepare a container to receive the leaking ink to prevent the product from getting contaminated by the leaked ink.**
- **Prior to the following steps, connect the injector with the tube, and then discharge ink according to the procedure.**

- Discharging procedure

1. Remove the Upper Housing Support Assy.(p.52)
2. With the choke value closed (p.38), place the Ink Supply Tank Assy on a place where its bottom is higher than the top of the Printhead.
3. Prepare a container for ink to discharge, then disconnect the Ink Supply Tube from the joint and put its tip into the container for the ink.
4. Open the choke valve to discharge the ink in the Ink Supply Tank Assy to the container.

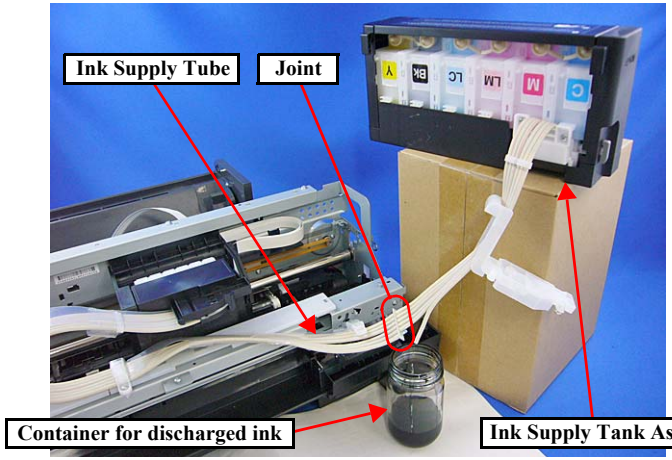


Figure 3-4. Discharging Ink (1)

5. Close the choke valve, then connect the tube connected with the injector to the Ink Supply Tank Tube.
6. Open the choke valve again, and suck up the remaining ink in the Ink Supply Tank into the injector.

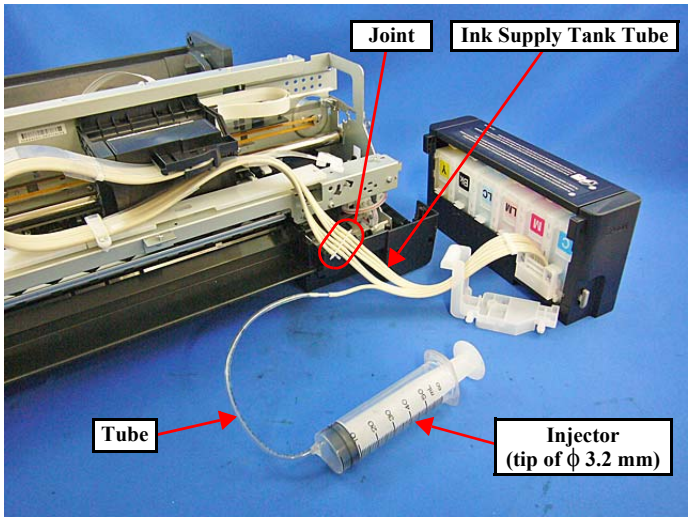
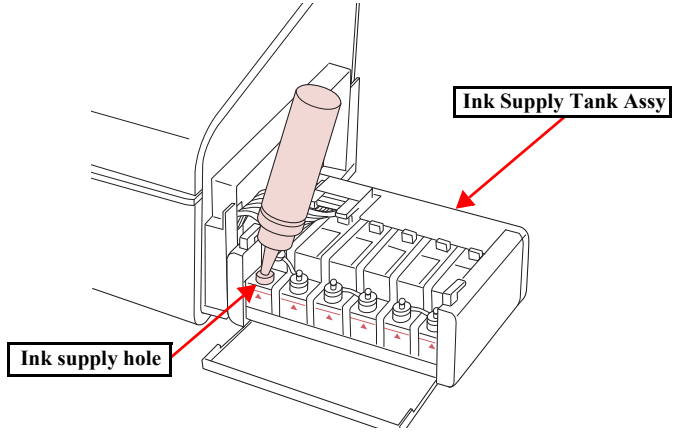


Figure 3-5. Discharging Ink (2)

7. Repeat Step 3 to Step 7 for all ink tanks to discharge all ink in the Ink Supply Tank.

CHECK POINT

- **It is recommended that the ink in the Ink Supply Tank should be discharged completely before proceeding to disassembling/ reassembling.**
- **After all the reassembling work is complete, the discharged ink of each color should be refilled back to the Ink Supply Tank before performing the adjustment. Confirm the colors indicated on the film of the Ink Supply Tank so as not to mistake them, and make sure to refill each ink back to the correct tank from the corresponding ink supply hole.**



3.1.5 Protection for Transportation

Before packing the printer for returning it to the user, secure it at the specified points with strong tape to avoid damaging the printer or ink leakage during transport, and make sure to check the points as follows.

☐ Securing each parts

Secure the following parts with strong tape.

■ Securing the Carriage Unit

Prepare a piece of strong tape (length: 205 ± 2 mm, width: 22 mm).

1. Confirm that the Carriage Unit is locked in the home position.
2. Attach the unfolded end of strong tape (fold the other end back 5 mm) on the bottom left of the Adapter Cover.
3. Move the carriage in the direction of the arrow (130 digit side) in Figure 3-6 until it touches the Carriage Lock.
4. Pull the tape toward the right side of the housing and attach it tightly along the shapes of the housing as shown in Figure 3-6 to secure the Carriage Unit.

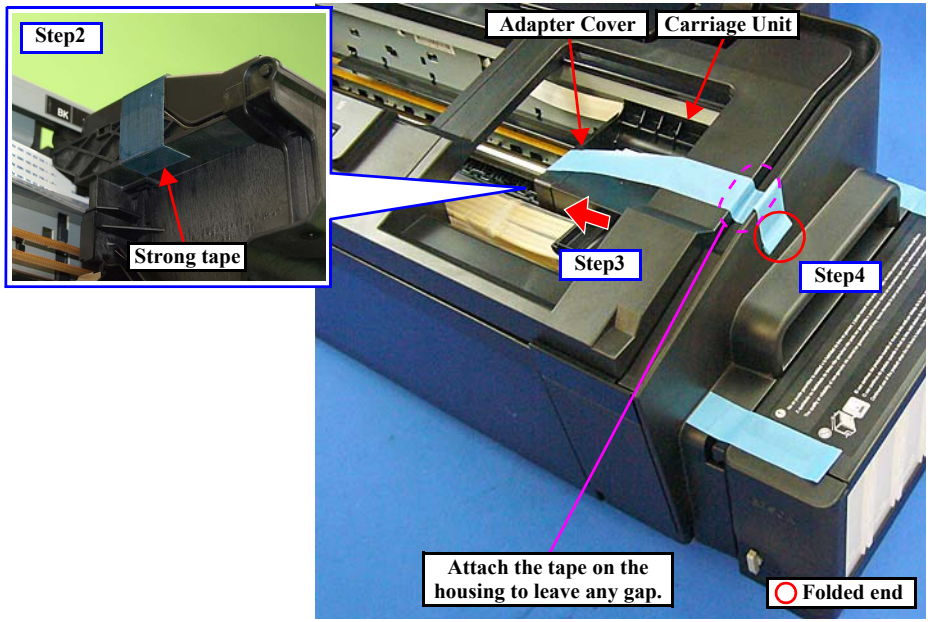


Figure 3-6. Securing the Carriage Unit

■ Securing the Ink Tank

Prepare two pieces of strong tape (length: 90 ± 2 mm, width: 22 mm).

1. Install the Ink Supply Tank Assy to the printer.
2. Secure the Decoration Plate Right, Ink Supply Tank Assy, and Top Cover with strong tape (x2).

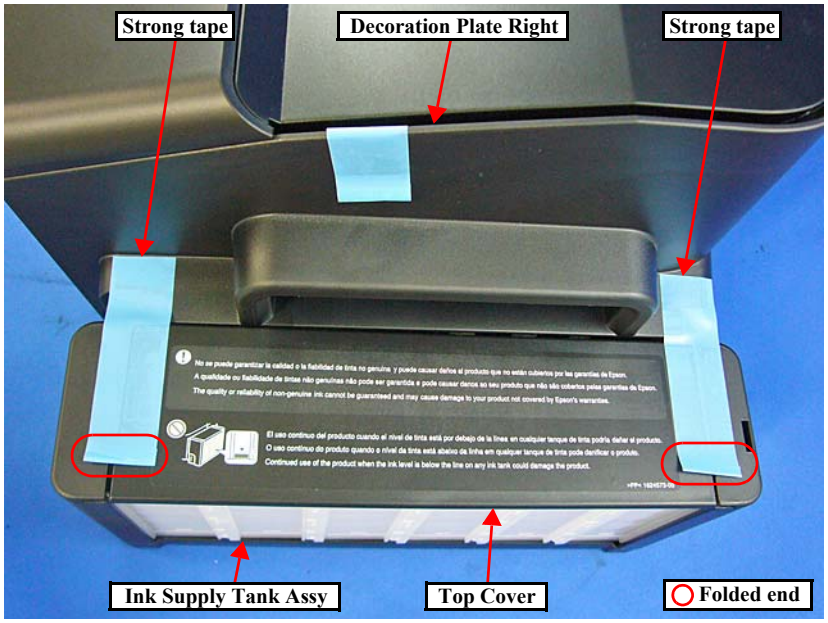
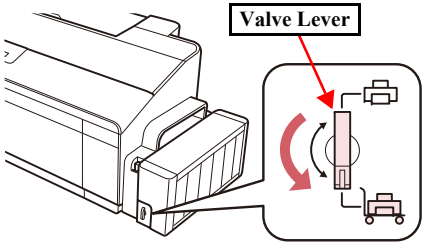


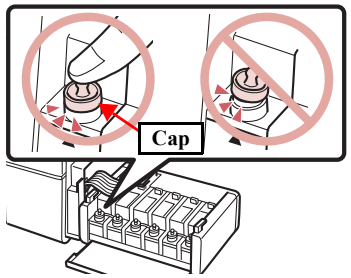
Figure 3-7. Securing the Ink Supply Tank Assy

☐ Points to be checked before packing the printer

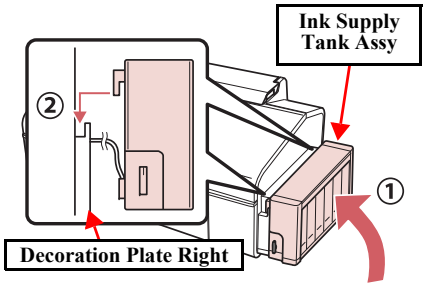
- The Valve Lever is on the position shown below (the Choke Valve is closed). (See Figure 3-3.)



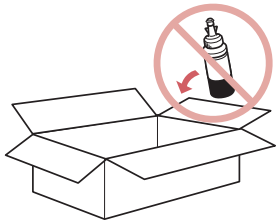
- All the caps of the Ink Supply Tank Assy are securely closed.



- The hooks (x2) of the Ink Supply Tank Assy are securely engaged with the Decoration Plate Right.



- The opened ink bottle is not included in the box.



3.1.6 Locking/Releasing the Carriage

Locking and releasing the Carriage is shown below.

1. Remove the Decoration Plate Right. *(Refer to 3.2.6 Decoration Plate Left/Right (p.49).)*
2. Insert a phillips screwdriver into the hole on the right side of the frame, and rotate the white shaft of the Ink System Unit.

Table 3-3. Carriage Lock/Release

Direction of Rotation	Carriage
Clockwise (CW)	Locked
Counterclockwise (CCW)	Released

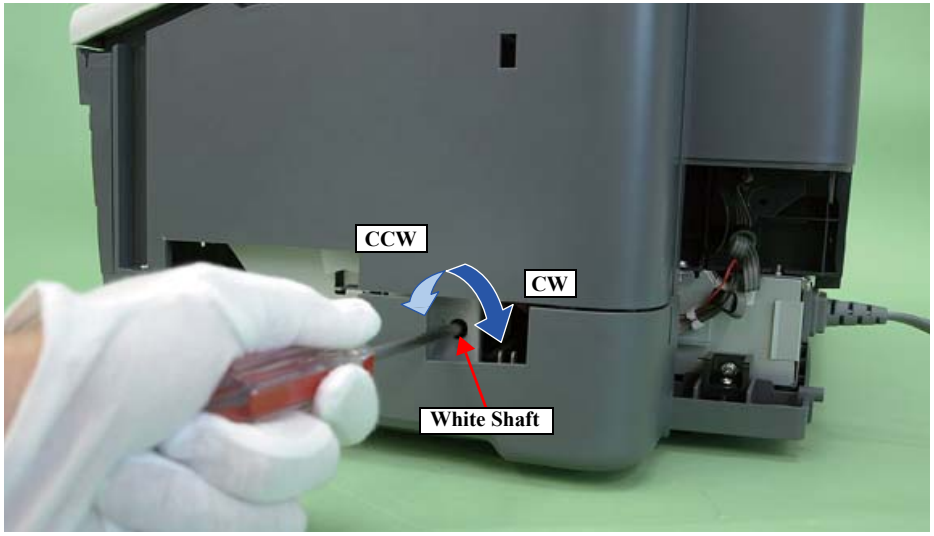


Figure 3-8. Release the Carriage Lock

3.1.7 Method for making Adapter Guide Holder removal tool

The Adapter Guide Holder (refer to p.58) can be easily removed by using a special tool. The method for making the tool is described below.

1. Prepare a handle part of a clip, or a similar metal wire piece.

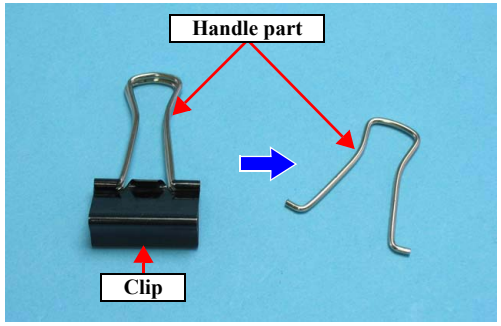


Figure 3-9. Method for making Adapter Guide Holder Removal Tool (1)

2. Bend the metal wire into dimensions described below.

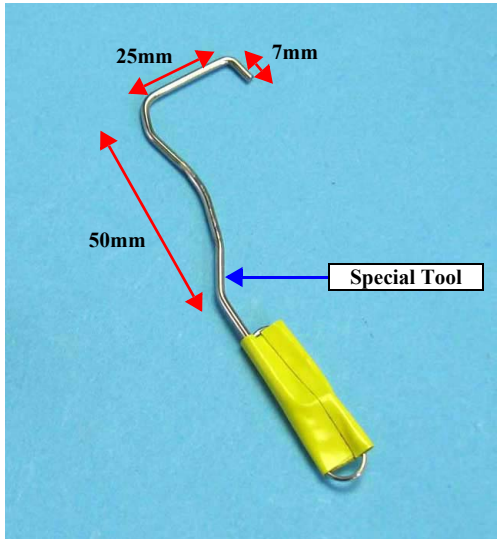


Figure 3-10. Method for making Adapter Guide Holder Removal Tool (2)

3.1.8 Disassembly

The flowchart below lists the step-by-step disassembly procedures. When disassembling each unit, refer to the page number shown in the figure.

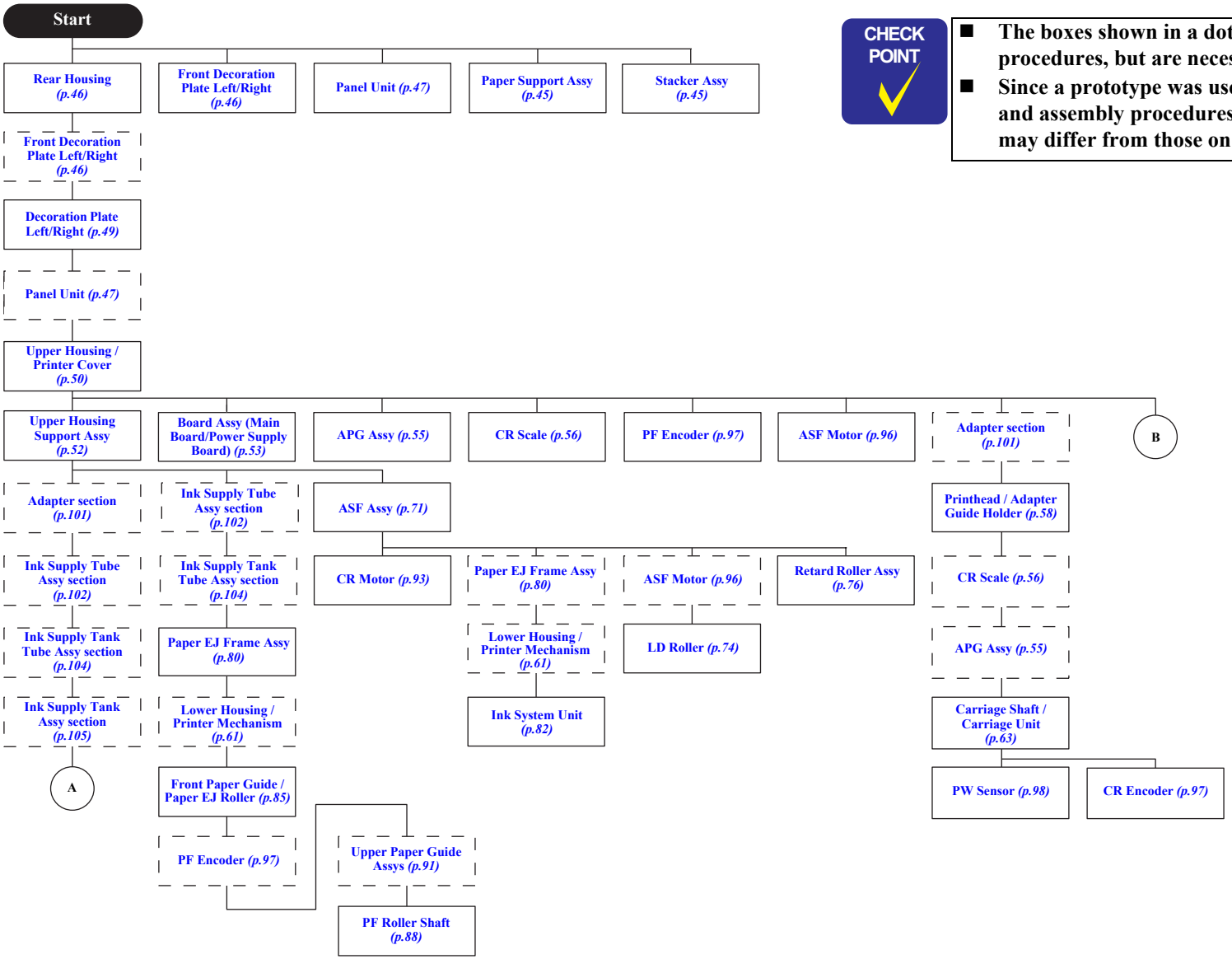


Figure 3-11. Disassembly Flowchart (1)

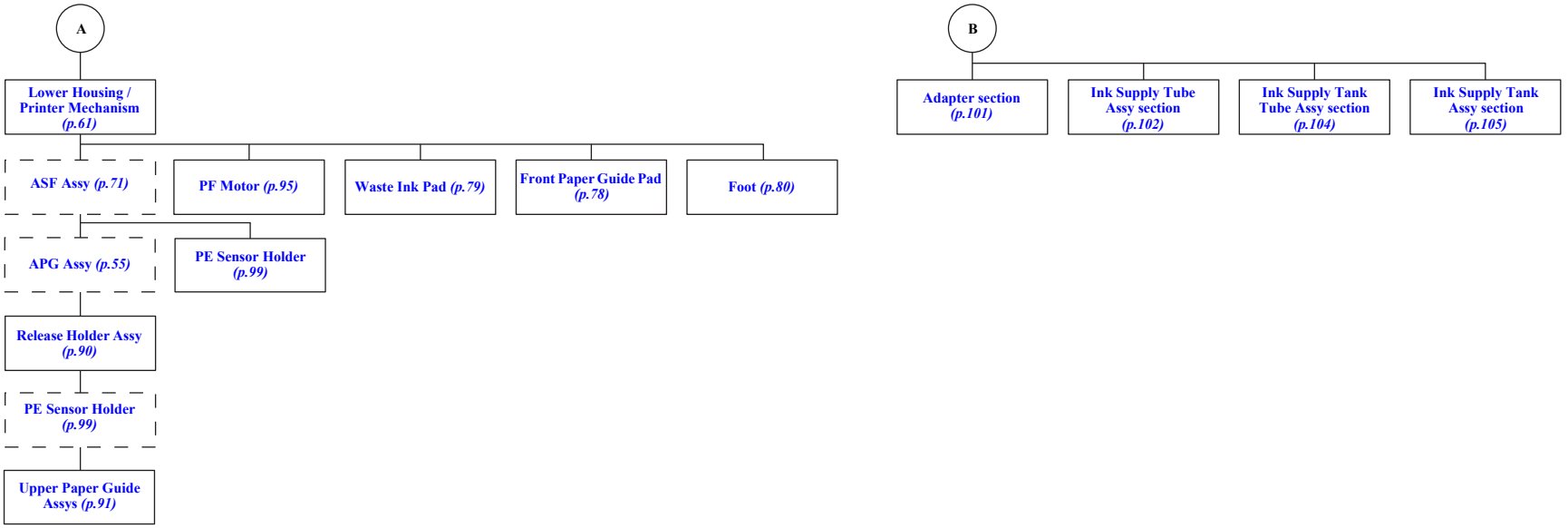


Figure 3-12. Disassembly Flowchart (2)

3.2 Removing the Housings

3.2.1 Paper Support Assy

1. While pulling out the left and right guide pins of the Paper Support Assy, remove the Paper Support Assy.

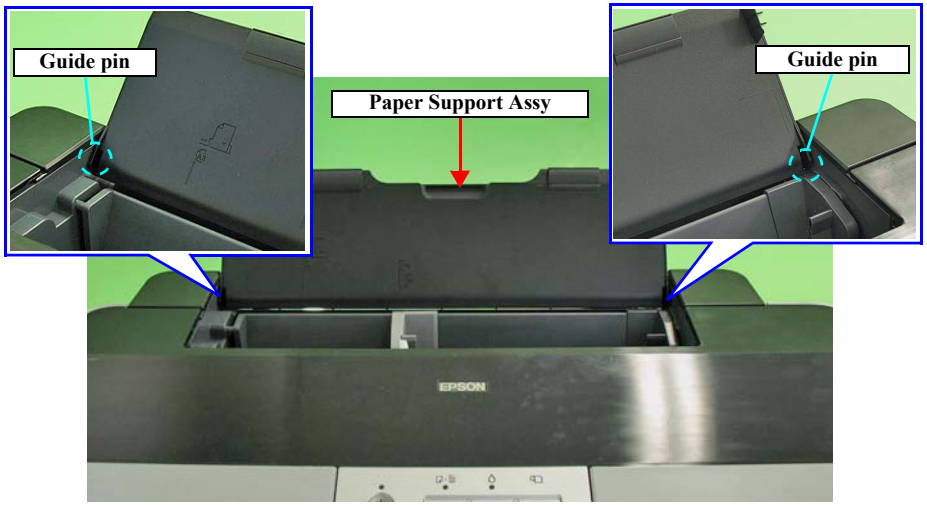


Figure 3-13. Removing the Paper Support Assy

3.2.2 Stacker Assy

1. To disengage the guide pin on the right of the Stacker Assy, push the Stopper in the direction of the arrow with a flathead screwdriver or similar tool.
2. Pull out the left guide pin of the Stacker Assy, and remove the Stacker Assy.

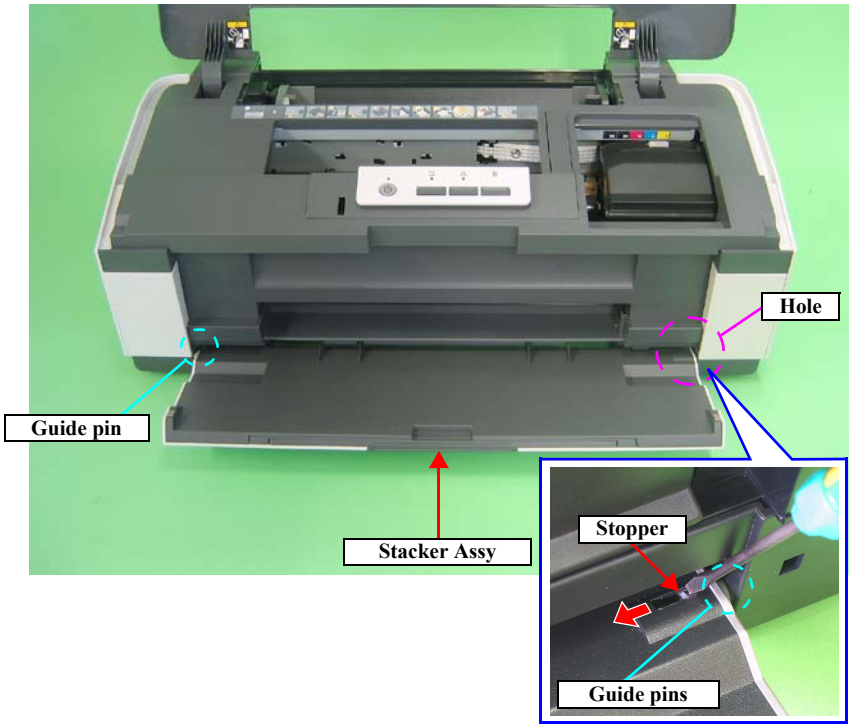


Figure 3-14. Removing Stacker Assy

3.2.3 Front Decoration Plate Left/Right

1. Open the Stacker Assy.
2. While releasing the hook on the Front Decoration Plate Left, open the plate in the direction of the arrow, and remove it.
3. In the same way, remove the Front Decoration Plate Right.

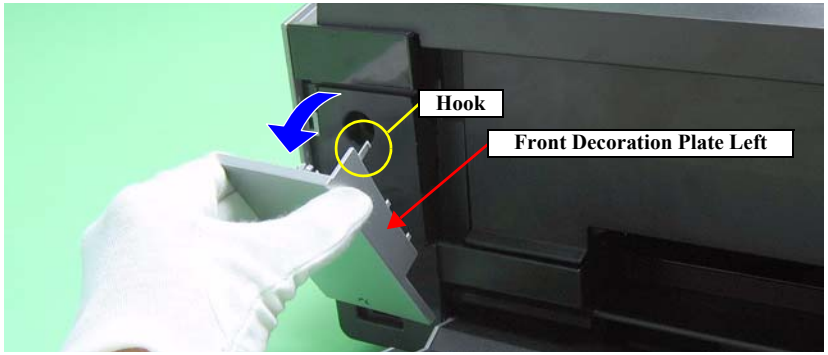


Figure 3-15. Removing the Front Decoration Plate Left/Right

REASSEMBLY

When installing the Front Decoration Plate L/R, insert the two hooks at the bottom of them into the holes of the Lower housing, then secure the Front Decoration Plate L/R with the other hooks.

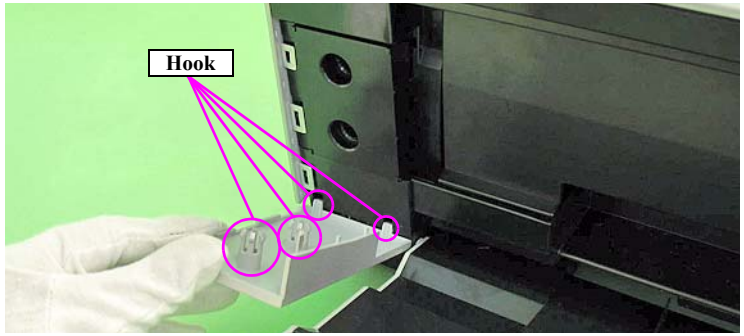


Figure 3-16. Reinstalling the Front Decoration Plate Left/Right

3.2.4 Rear Housing

1. Remove the two C.B.P. M3 x 8 screws and the C.B.S. M3 x 6 screw that secure the Rear Housing.
2. Disengage the two tabs from the Upper Housing and remove the Rear Housing.

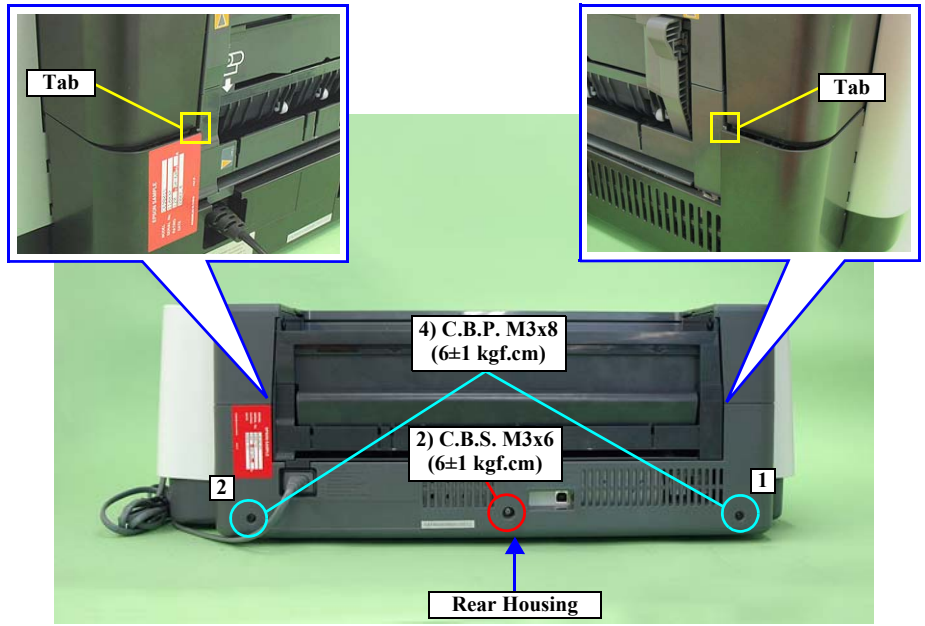


Figure 3-17. Removing the Rear Housing

REASSEMBLY

Tighten the screws in the order shown in Figure 3-17.

REASSEMBLY

- **Align the positioning tabs (one each on the left/right) with the positioning holes (one each on the left/right) on the Upper Housing.**
- **Align the positioning tabs (three each on the left/right) with the positioning holes (three each on the left/right) on the Decoration Plate Left/Right and the Lower Housing.**

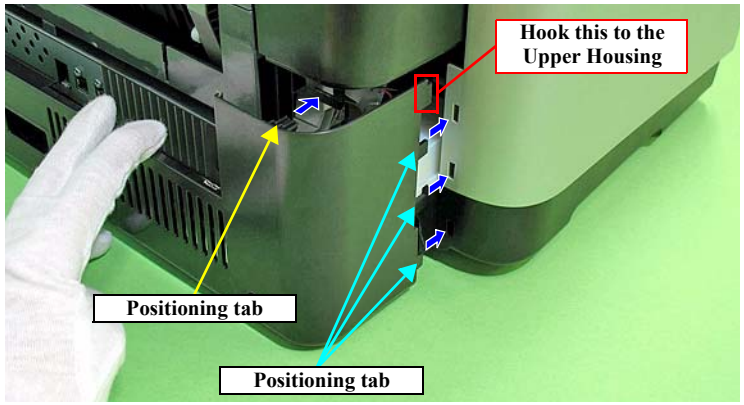


Figure 3-18. Reinstalling the Rear Housing

3.2.5 Panel Unit

1. Open the Printer Cover.

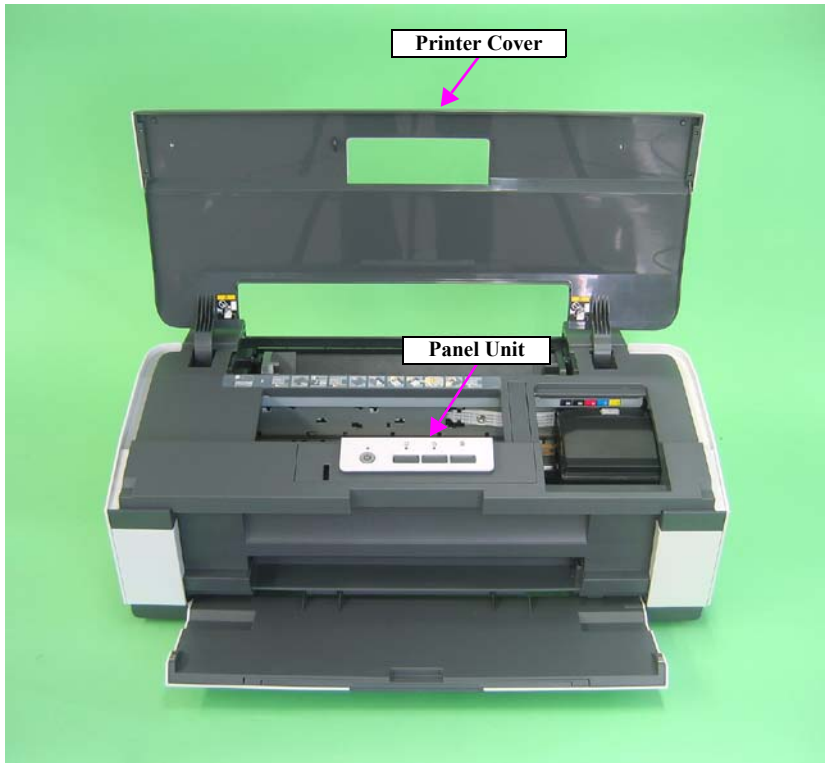


Figure 3-19. Removing the Panel Unit (1)

2. Disengage the nine hooks on the bottom of the Panel Unit, and remove the Panel Unit while pulling out its tab.
3. Disconnect the Panel FFC from the Panel Board connector and remove the Panel Unit.

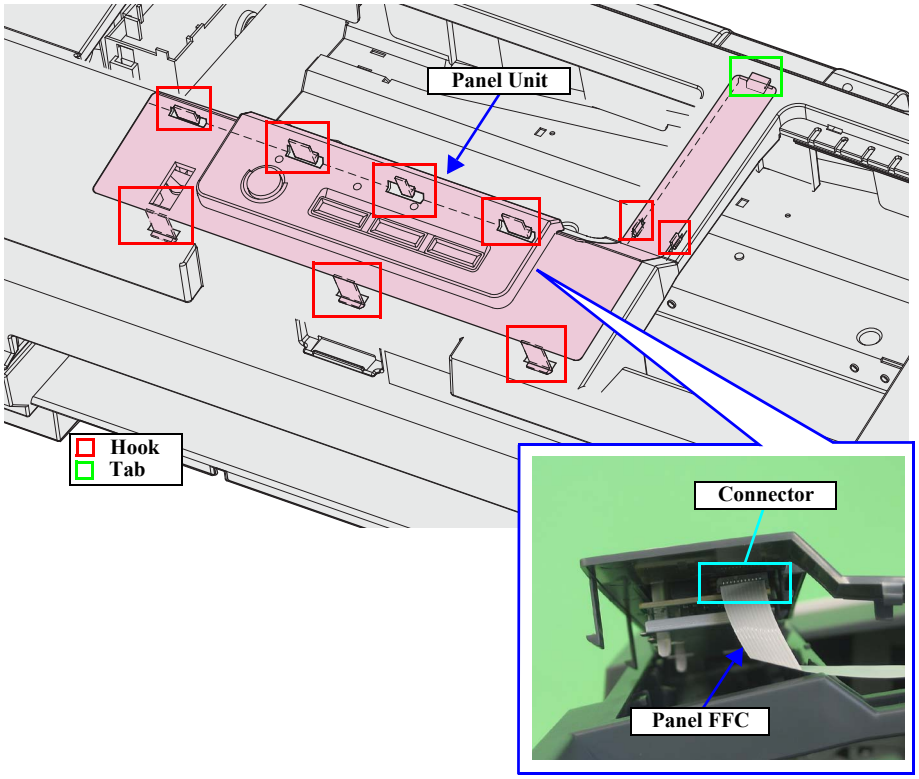


Figure 3-20. Removing the Panel Unit (2)

REASSEMBLY

- **Be careful not to get the Panel FFC caught underneath the hooks on the Panel Unit.**
- **Secure the Panel FFC to the Panel Unit with a piece of double-sided tape.**

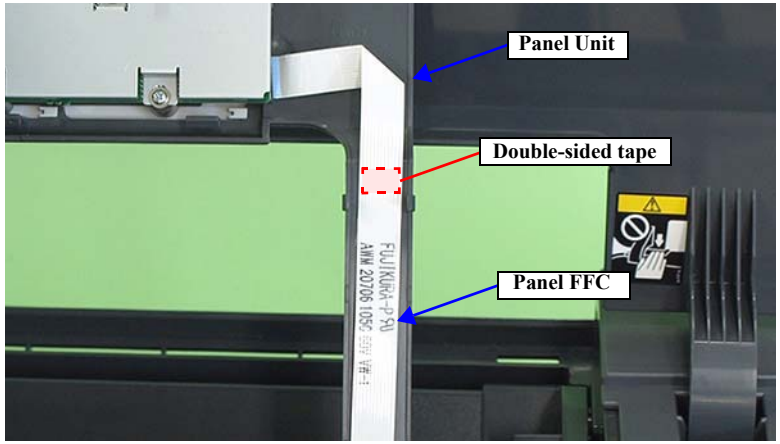


Figure 3-21. Securing the Panel FFC

3.2.6 Decoration Plate Left/Right

1. *Remove the Rear Housing. (p.46)*
2. *Remove the Front Decoration Plate Left/Right. (p.46)*
3. Remove the Ink Supply Tank Assy from the Decoration Plate Right.
4. Remove the four C.B.P. M3 x 8 screws that secure the Ink Eject Cover 1st, and remove the Ink Eject Cover 1st.
5. Remove the four C.B.P. M3 x 8 screws that secure the Ink Eject Cover 2nd, and remove the Ink Eject Cover 2nd.
6. Remove the two C.B.P. M3 x 8 screws that secure the Decoration Plate Right.

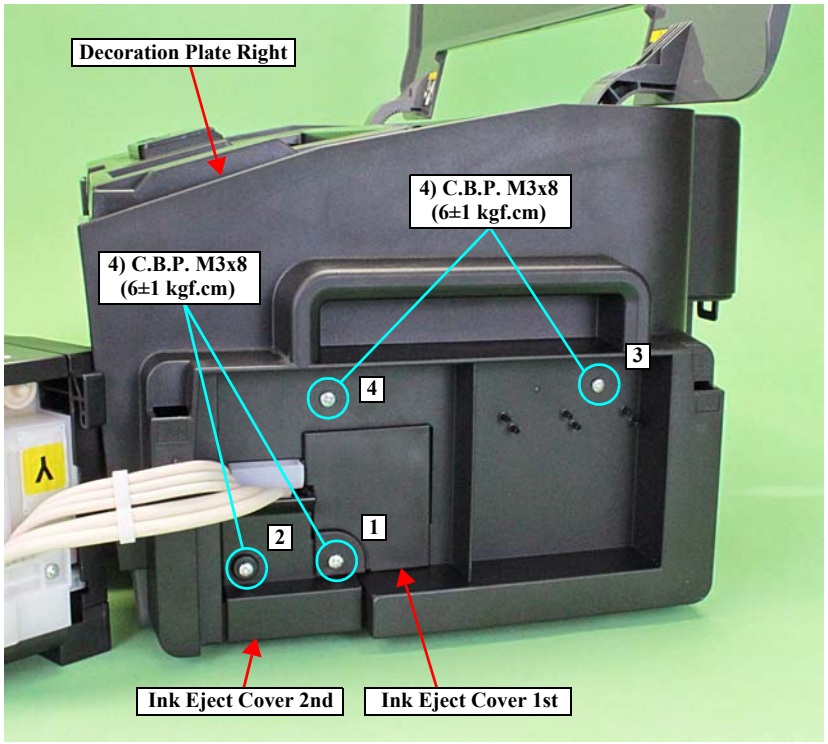


Figure 3-22. Removing the Decoration Plate Left/Right (1)

7. Release the three hooks on the front of the Decoration Plate Right and lift the plate a little to release the tab and the four guide pins on the upper side, then remove the Decoration Plate Right.
8. In the same way as in Step 7, remove the Decoration Plate Left.

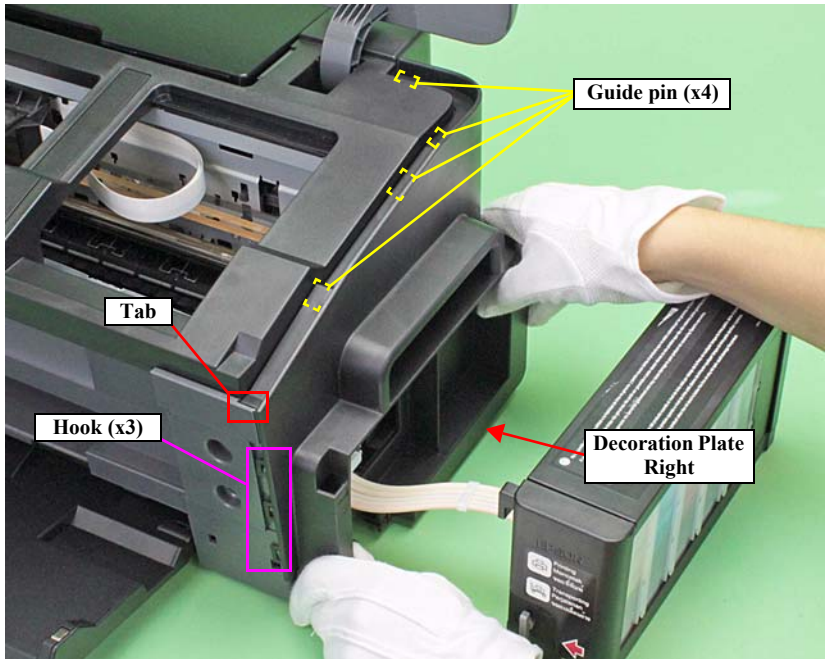


Figure 3-23. Removing the Decoration Plate Left/Right (2)

REASSEMBLY

- **When installing the Decoration Plate L/R, first align the hooks of the Decoration Plate L/R (two each) with the ribs of the Lower Housing (two each on the left/right), and then align the tab inside the Decotrative Plate L/R (one each) with the positioning hole on the Upper Housing (one each on the left/right).**

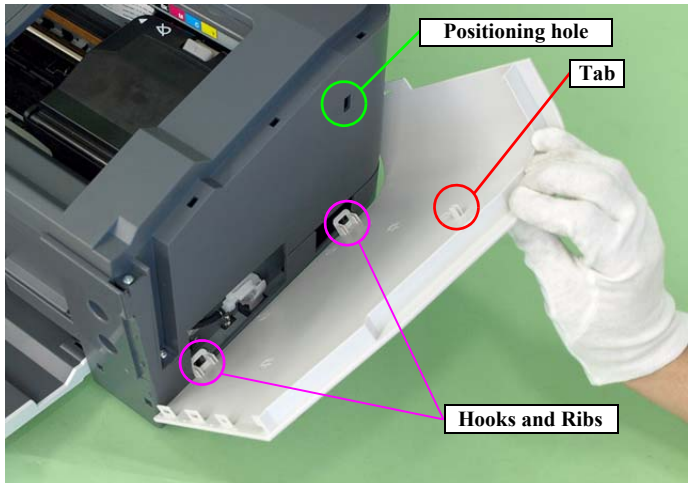


Figure 3-24. Reinstalling the Decoration Plate Left/Right

- **For the Decoration Plate Right, Ink Eject Cover 2nd, and Ink Eject Cover 1st, screw in the order given in Figure 3-22.**

3.2.7 Upper Housing / Printer Cover

1. *Remove the Decoration Plate Left/Right. (p.49)*
2. *Remove the Panel Unit. (p.47)*
3. Remove the seven C.B.P. M3 x 10 screws that secure the Upper Housing.
4. Remove the Upper Housing while pulling out the Panel FFC through the cutout of the Upper Housing.

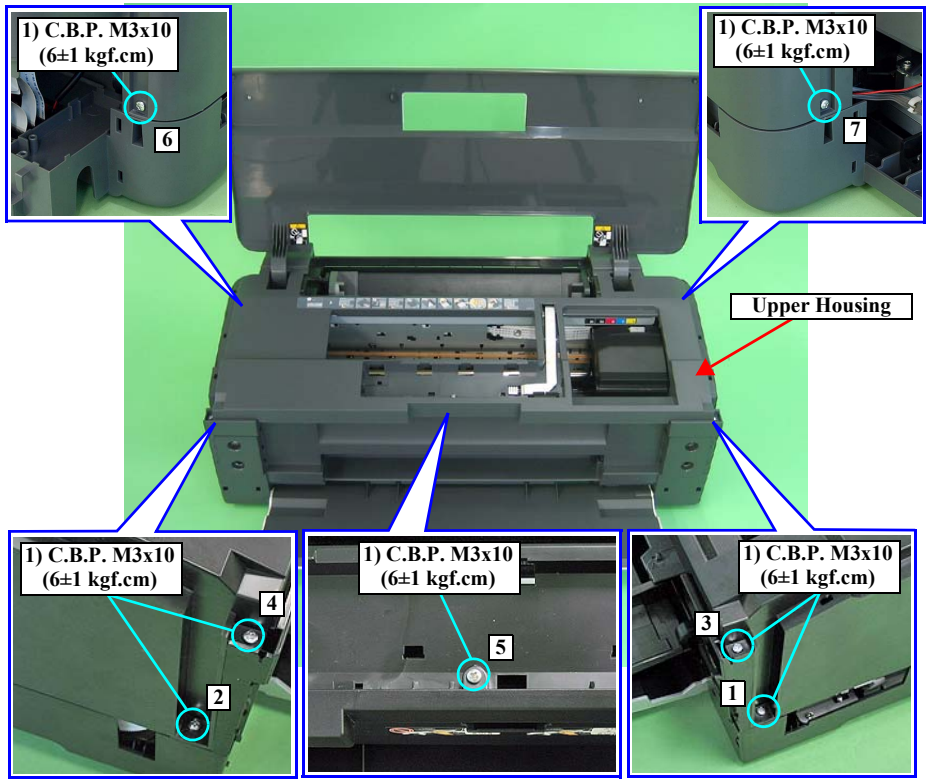


Figure 3-25. Remove the Upper Housing

REASSEMBLY

- Route the Panel FFC correctly as shown in Figure 3-21.
- Install the Upper Housing so that the Grounding Plate properly protrudes through the cutout of the Upper Housing.

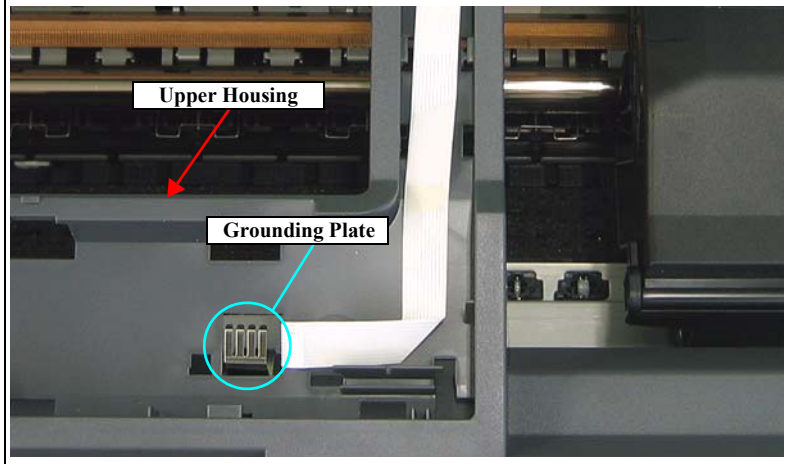


Figure 3-26. Routing the Panel FFC

- Tighten the screws in the order shown in Figure 3-25.

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-74 grease to the area specified for each part.

- Upper Housing: See Figure 5-14 on page 139.

REMOVING THE PRINTER COVER

1. *Remove the Upper Housing / Printer Cover. (p.50)*
2. Remove the two C.B.P. M3 x 8 screws that secure Printer Cover Holder Left/ Right.

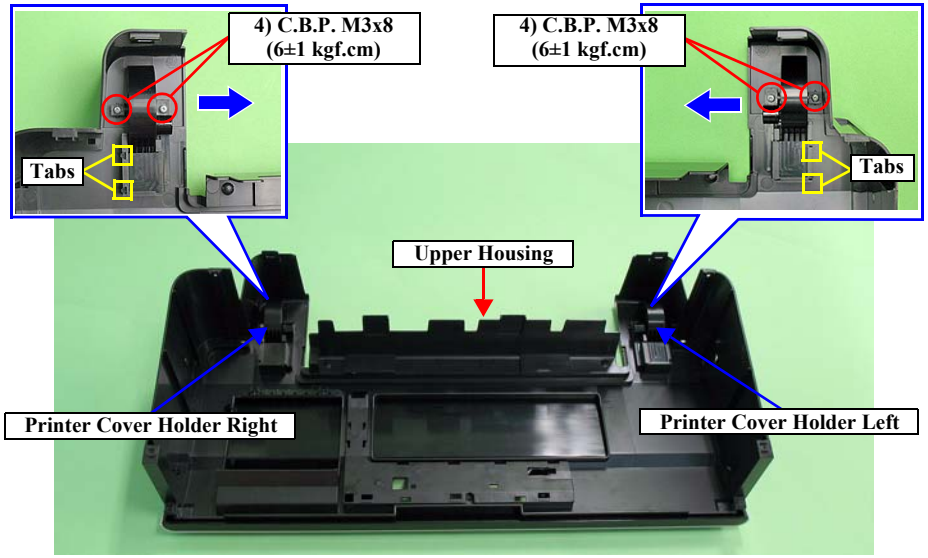


Figure 3-27. Removing the Printer Cover Holder Left/Right

REASSEMBLY

Insert the tabs (two each on the left/right) shown in Figure 3-27 into the holes on the Upper Housing.

CAUTION

Be careful not to damage the surface in step 3 and later.

3. Remove the Printer Cover Holder Right following the steps below.

   3-1. With the Printer Cover open, put the Upper Housing with the rear side up.

CAUTION

When performing the following steps, be careful not to damage the tabs of the Printer Cover Holder Right.

   3-2. Slide the Printer Cover Holder Right in the direction of the arrow while lifting it, and remove the Printer Cover Holder Right from the Upper Housing.

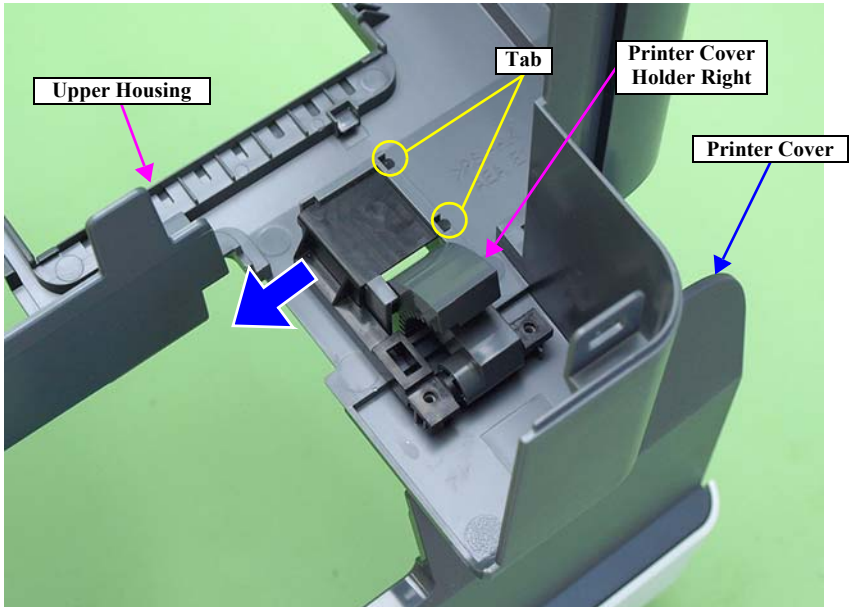


Figure 3-28. Removing the Printer Cover

4. While holding the Printer Cover, remove the Printer Cover Holder Left in the same manner as Step 3-2, and remove the Printer Cover from the Upper Housing.

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-26 grease to the area specified for each part.

- **Printer Cover Holder Left: Chapter 5 See Figure 5-13 (p.139).**
- **Printer Cover Holder Right: Chapter 5 See Figure 5-13 (p.139).**

3.2.8 Upper Housing Support Assy

1. *Remove the Upper Housing / Printer Cover. (p.50)*
2. Remove the two C.B.S. M3 x 6 screws and two C.B.P. M3 x 10 screws that secure the Upper Housing Support Assy, and remove the Upper Housing Support Assy.

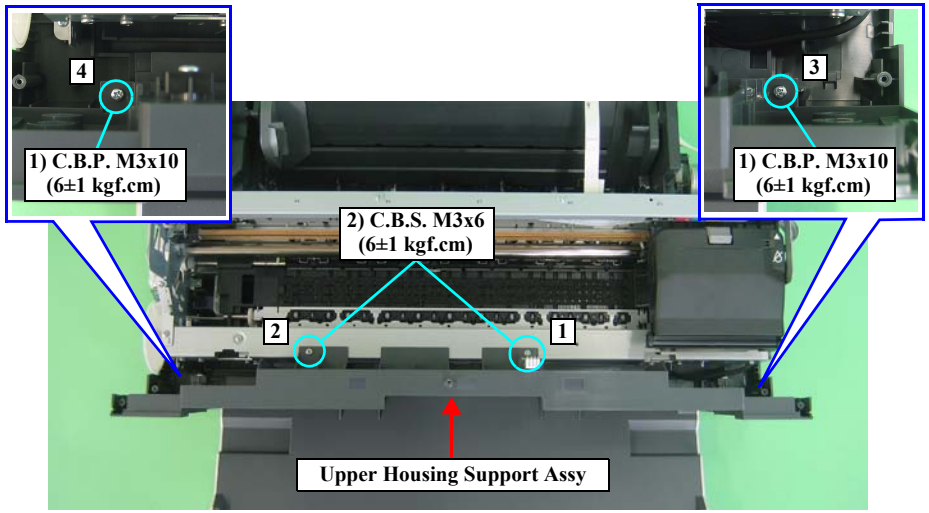


Figure 3-29. Removing the Upper Housing Support Assy

REASSEMBLY

- **Secure the Grounding Plate with one of the C.B.S. M3 x 6 screws together with the Upper Housing as shown below.**
- **Tighten the screws in the order shown in Figure 3-29.**

3.3 Removing the Boards

3.3.1 Board Assy (Main Board/Power Supply Board)

1. *Remove the Upper Housing / Printer Cover. (p.50)*
2. Remove the seven screws (four C.B.S. M3 x 6, two C.B.S. (P2) M3 x 8, and one C.B.S. M3 x 8) that secure the Board Assy.

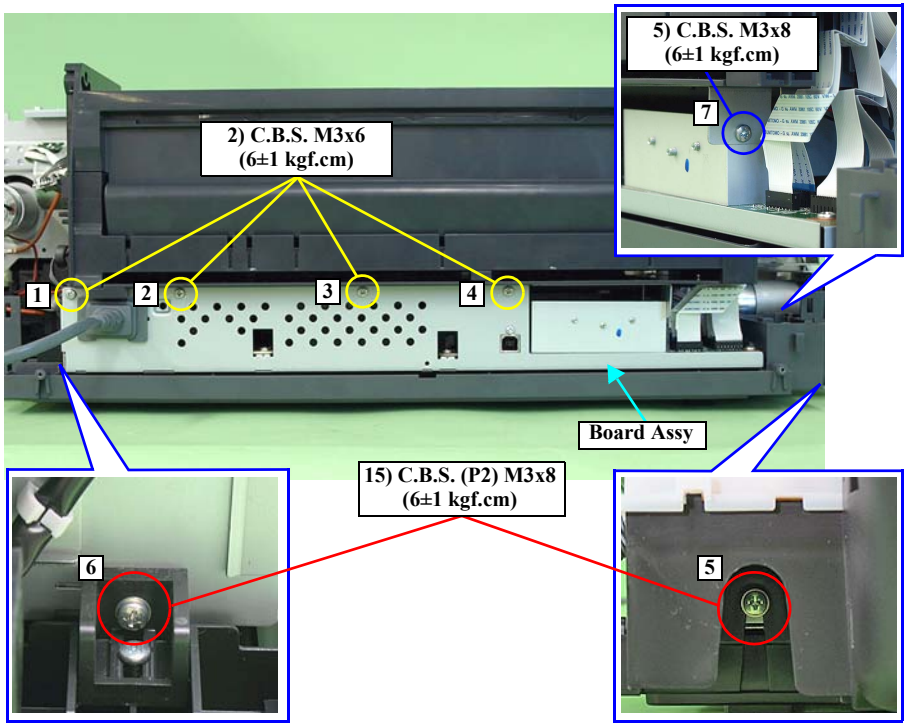


Figure 3-30. Removing the Board Assy (1)

REASSEMBLY

Tighten the screws in the order shown in Figure 3-30.

3. Disconnect all the cables and FFCs connected on the Main Board from the near side one by one.

No.	Connector	No.	Connector
CN4	Panel Board	CN115	CR Motor
CN5	Relay FFC (for sensor)	CN116	PF Motor
CN9	CR Encoder Sensor, PW Sensor	CN117	Pump Motor
CN12	Print Head	CN118	APG Motor
CN13	Print Head	CN119	ASF Motor
CN14	Print Head		

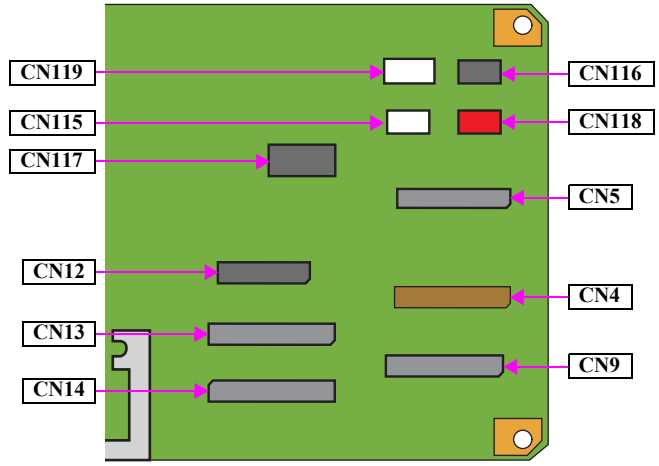


Figure 3-31. Connector Layout of the Main Board (130 Digit Side)

4. Pull out the Board Assy from the Printer.

Figure 3-32. Removing the Board Assy (2)

Confirm that the FFCs do not cross each other first, then connect the FFCs and the cables to the Main Board while paying attention to the edge of the Shield Plate.

REMOVING THE MAIN BOARD

1. *Remove the Board Assy (Main Board/Power Supply Board). (p.53)*
2. Disconnect the Power Board cable from connector CN60 on the Main Board.
3. Remove the four C.B.S. M3 x 6 screws and one C.P. M3 x 4 screw that secure the Main Board and remove the Main Board from the Board Assy.

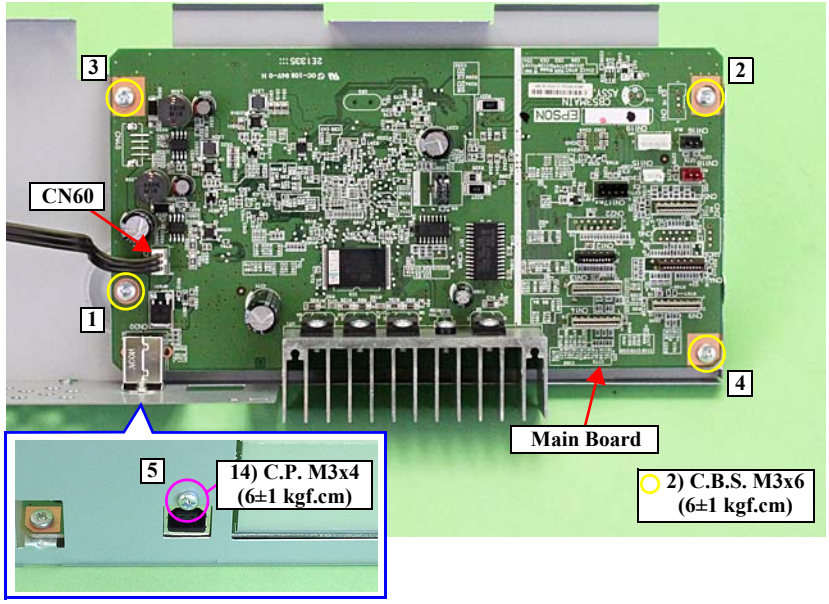


Figure 3-33. Removing the Main Board

REMOVING THE POWER BOARD

1. *Remove the Board Assy (Main Board/Power Supply Board). (p.53)*
2. Disconnect the Power Board cable from connector CN60 on the Main Board. (p.54)
3. Remove the four C.B.S. M3 x 6 screws that secure the Power Board and remove the Power Board from the Board Assy.

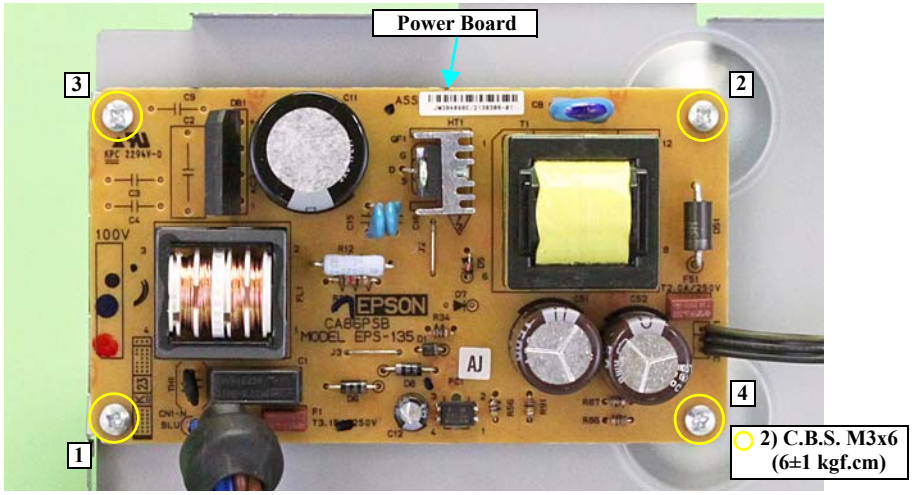


Figure 3-34. Removing the Power Board

Tighten the screws in the order shown in Figure 3-33 and Figure 3-34.

After replacing or removing the Main Board and the Power Board, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

3.4 Disassembling the Printer Mechanism

3.4.1 APG Assy

1. *Remove the Upper Housing / Printer Cover. (p.50)*
2. Disconnect the APG Motor connector cable from connector CN118 (red) on the Main Board.
3. Peel off the acetate tape A and acetate tape B, and release the APG Motor cable from the ASF Assy.
4. Disconnect the cables from the two APG Sensor connectors.

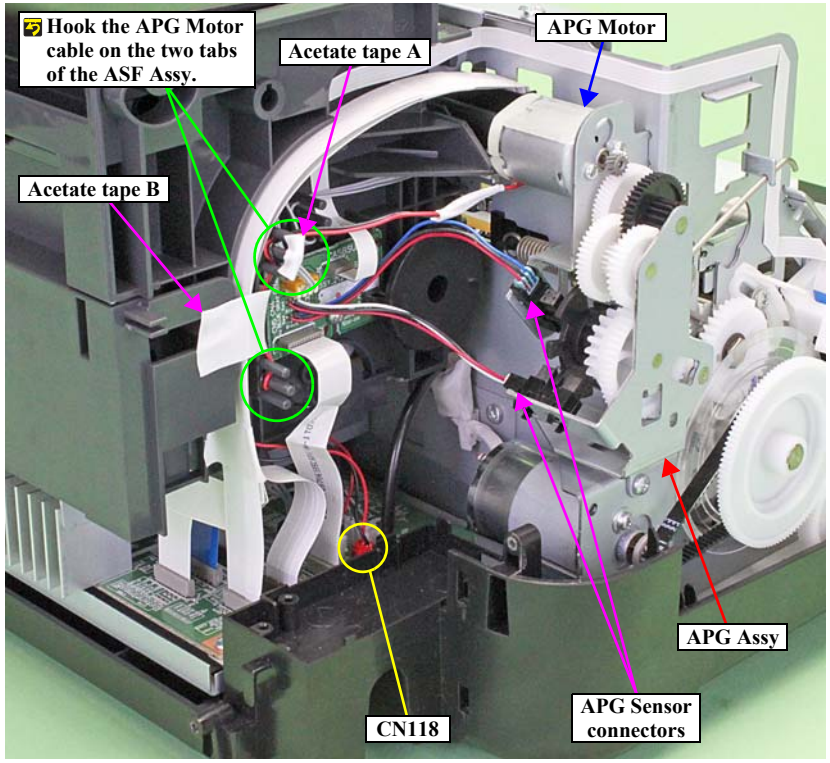


Figure 3-35. Disconnecting the Cables

REASSEMBLY

- **Referring to Figure 3-35, correctly route the APG connector cable.**
- **Apply the acetate tape A according to the standard below.**

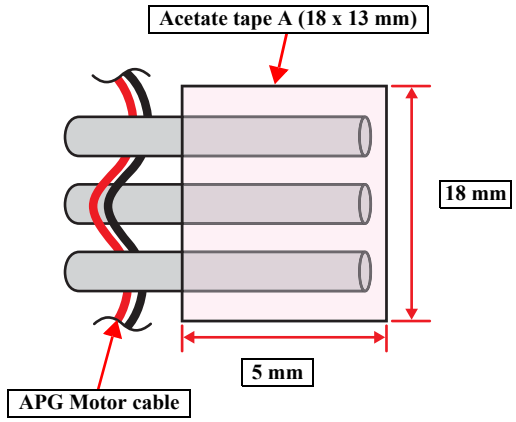


Figure 3-36. Applying the Acetate tape A

5. Remove the three C.B.S. M3 x 6 screws that secure the APG Assy, and remove the APG Assy from the Main Frame.

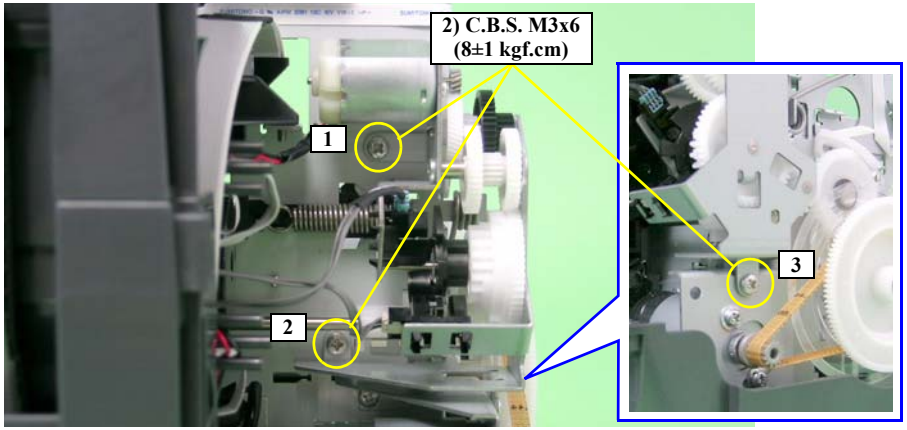
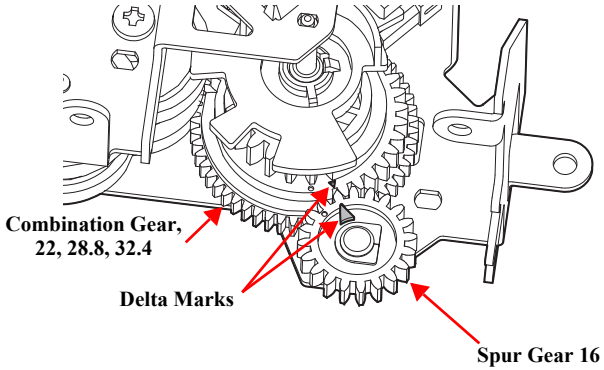


Figure 3-37. Removing the APG Assy

REASSEMBLY

■ **Align the phase of the APG Assy in the following procedure.**

1.Align the delta marks of Spur Gear 16 and Combination Gear 22, 28.8, 32.4.



2. At the position where the tab can be identified through the notch of the PG Frame, align the delta marks of Spur Gear 16 and PG Cam (Left).

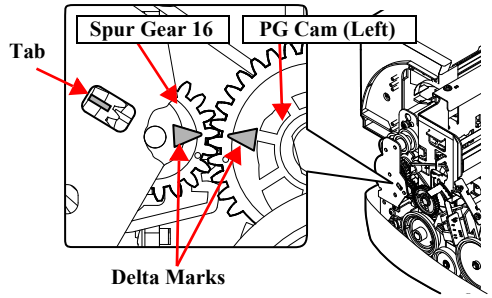


Figure 3-38. Phase Aligning

■ **Tighten the screws in the order shown in Figure 3-37.**

3.4.2 CR Scale

1. *Remove the Upper Housing / Printer Cover. (p.50)*
2. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 3.1.6 Locking/Releasing the Carriage (p.41).)*

CAUTION

When performing the following procedure, take care to prevent both ends of the CR Scale from being broken.

3. Pull the right end of the CR Scale in the direction of the arrow, and remove the CR Scale from the tab on the Right CR Shaft Mounting Plate.
4. Pull out the right end of the CR Scale towards the left direction from the rear of the Carriage Unit.

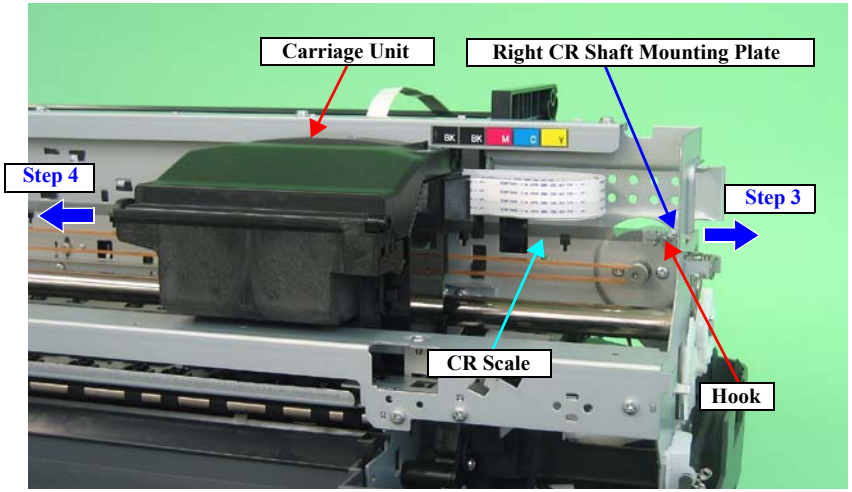


Figure 3-39. Pulling out the CR Scale

5. Remove the coil section of Torsion Spring 24.7 from the tab on the Left CR Shaft Mounting Plate with tweezers.

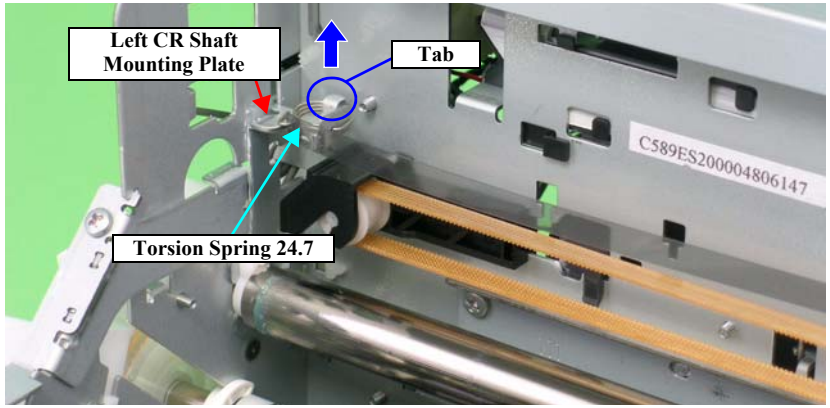


Figure 3-40. Removing the Torsion Spring 24.7 (1)

6. Remove Torsion Spring 24.7 from the CR Scale by the following procedure:

   6-1. Stand the coil section.
   6-2. Lower the coil section downwards to remove Foot 1 from the notch on the Left CR Shaft Mounting Plate.
   6-3. Turn the coil section counterclockwise.
   6-4. Remove Torsion Spring 24.7 from the hole on the CR Scale.

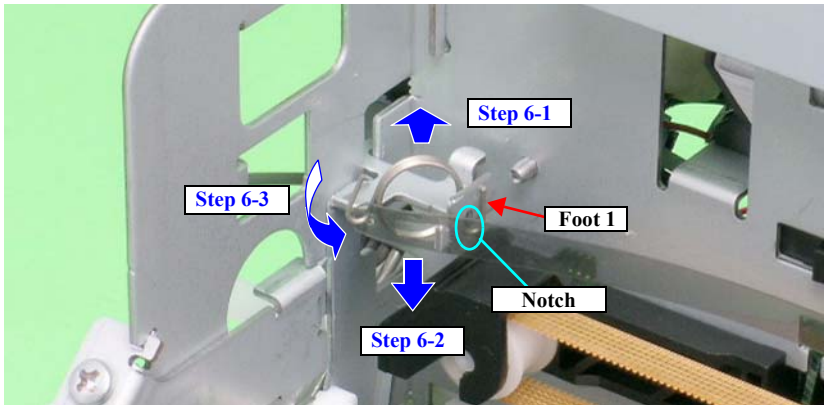


Figure 3-41. Removing the Torsion Spring 24.7 (2)

7. Turn the CR Scale 90º, and remove it from the tab on the Left CR Shaft Mounting Plate.

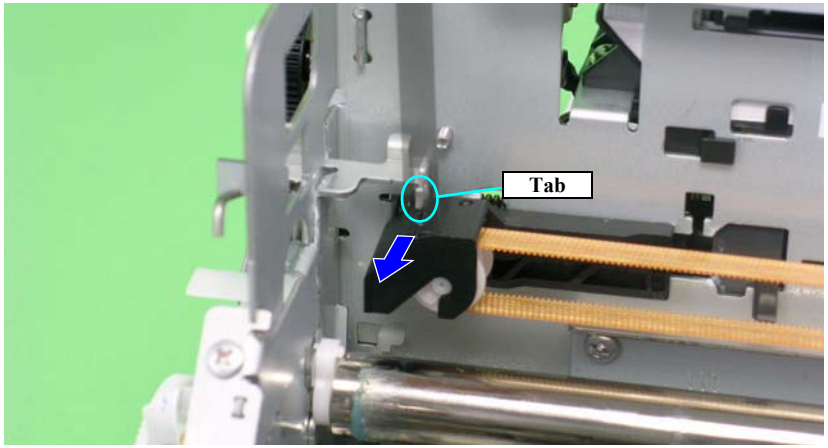


Figure 3-42. Removing the CR Scale

REASSEMBLY

- **Pass the CR Scale through the slot on the CR Encoder.**

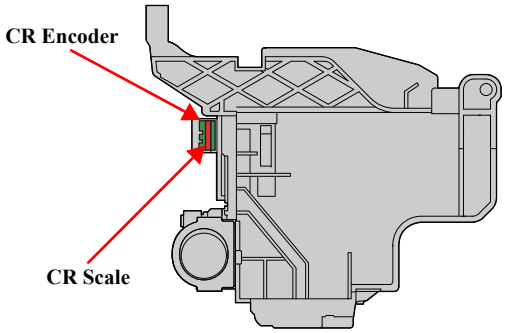


Figure 3-43. Reinstalling the CR Scale (1)

- **Set the left end of the CR Scale with the black mark facing upwards.**

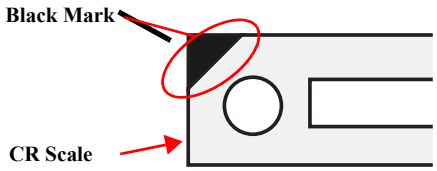


Figure 3-44. Reinstalling the CR Scale (2)

- **Place the right end of the CR Scale correctly so that it is not hooked onto the Right CR Shaft Mounting Plate.**

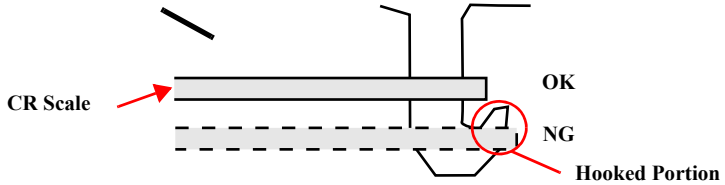


Figure 3-45. Reinstalling the CR Scale (3)

3.4.3 Printhead / Adapter Guide Holder

CAUTION

- **So as not to damage the FFC, do not use any tools with the sharp ends when removing the Cable Holder.**
- **Be careful not to break the hooks of the Cable Holder.**

1. *Remove the Upper Housing / Printer Cover. (p.50)*
2. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 3.1.6 Locking/Releasing the Carriage (p.41).)*
3. *Remove the Adapter section. (p.101)*
4. Release the dowel and two hooks of the Cable Holder, and remove the Cable Holder.

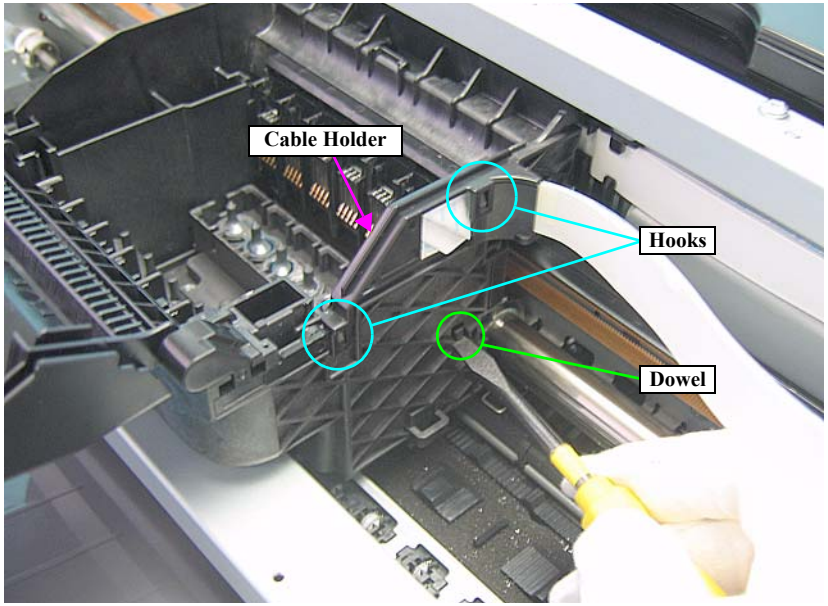


Figure 3-46. Removing the Adapter Guide Holder (1)

5. Using the special tool (refer to Method for making Adapter Guide Holder removal tool (p42)), disengage tab A of the Adapter Guide Holder on the right rear side of the Carriage Unit.

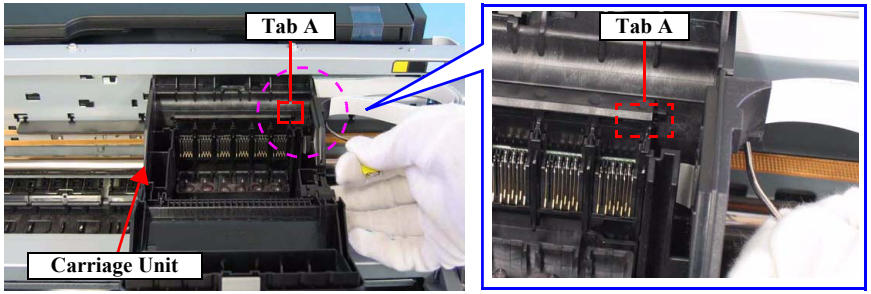


Figure 3-47. Removing the Adapter Guide Holder (2)

6. Using the special tool (refer to Method for making Adapter Guide Holder removal tool (p42)), disengage tab B of the Adapter Guide Holder on the right rear side of the Carriage Unit.

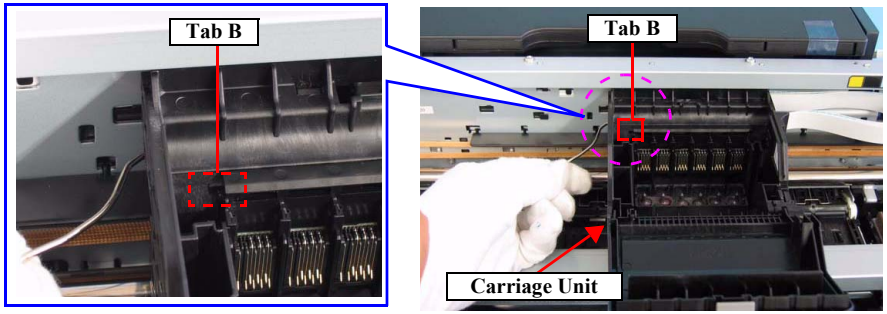


Figure 3-48. Removing the Adapter Guide Holder (3)

7. Lift the Adapter Guide Holder and remove it.

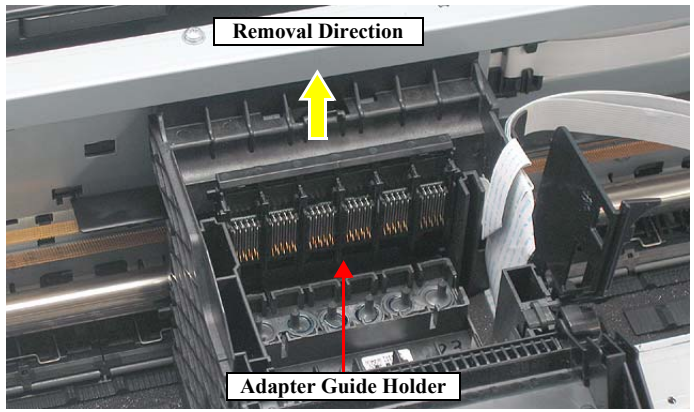


Figure 3-49. Removing the Adapter Guide Holder (4)

8. Remove the three C.B.P. M2.6 x 8 screws that secure the Printhead using the Phillips Screw Driver, No.1, and vertically lift the Printhead to remove it.

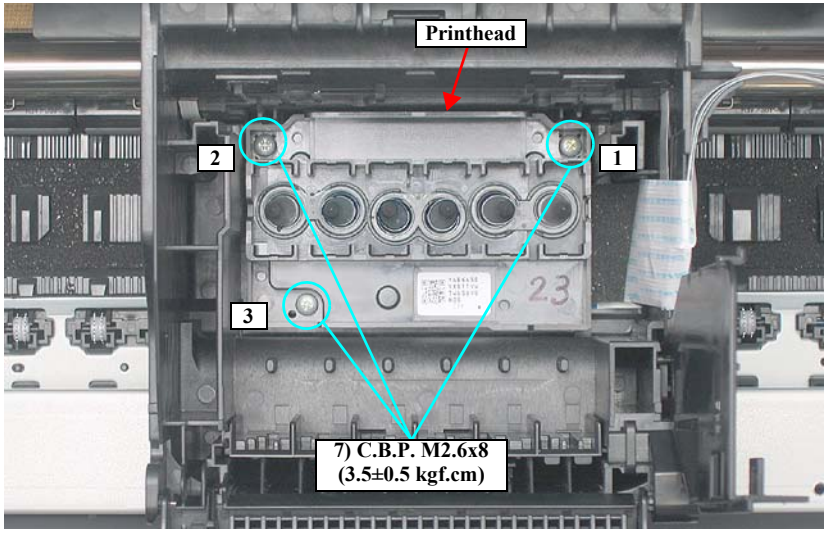


Figure 3-50. Removing the Printhead (1)

9. Disconnect the two Head FFCs on the back side, and remove the Printhead.

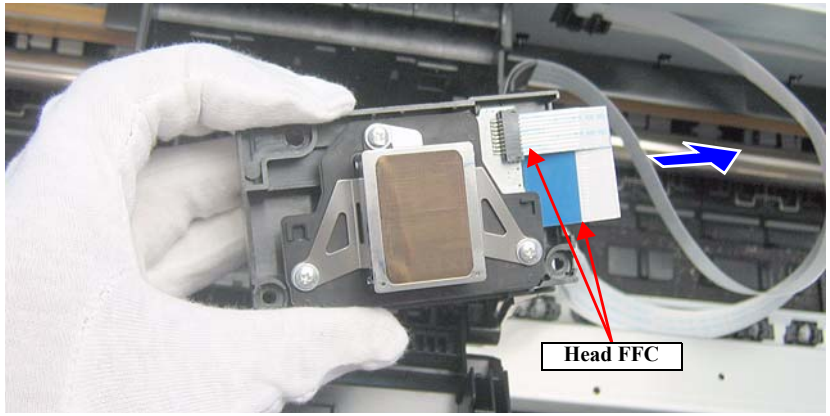


Figure 3-51. Removing the Printhead (2)

REASSEMBLY

Tighten the screws in the order shown in Figure 3-50

ADJUSTMENT REQUIRED

After replacing or removing the Printhead, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

3.4.4 Lower Housing / Printer Mechanism

1. *Remove the Upper Housing Support Assy. (p.52)*
2. *Remove the Adapter section. (p.101)*
3. *Remove the Ink Supply Tube Assy section. (p.102)*
4. *Remove the Ink Supply Tank Tube Assy section. (p.104)*
5. *Remove the Ink Supply Tank Assy section. (p.105)*
6. Grip both ends of the Ink Tube Fastener with your fingers, slide it in the direction of the arrows, and draw out the Waste Ink Tube from the Ink Tube.
7. Remove the C.B.P. M3 x 12 screw and the C.B.S. (P2) M3 x 10 screw that secure the Shield Plate Holder, and remove the Shield Plate Holder.
8. Remove the five screws (four C.B.P. M3 x 10 screws and one C.B.S. (P2) M3 x 10 screw) secure the Printer Mechanism.

CAUTION

When performing the following step, make sure to grasp the Printer Mechanism by the specified positions shown below. Otherwise, the frames may become deformed.

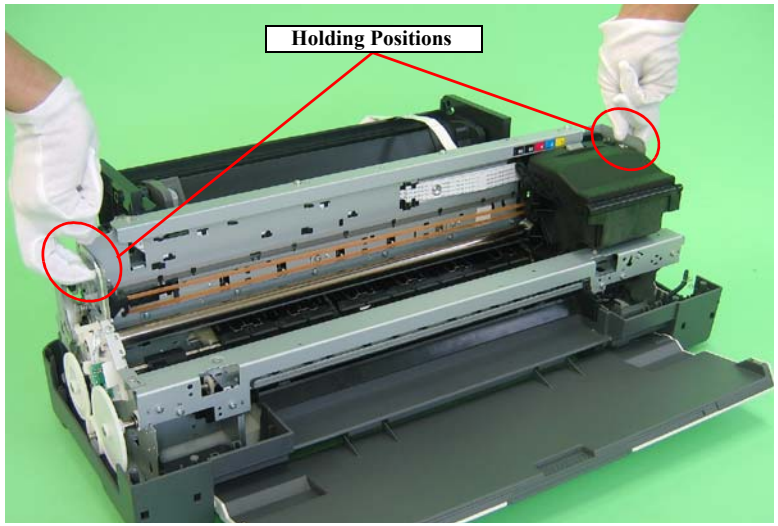


Figure 3-52. Handling the Printer Mechanism

9. Lift the Printer Mechanism grasping it by the holding positions with your hands, and remove it from the Lower Housing.

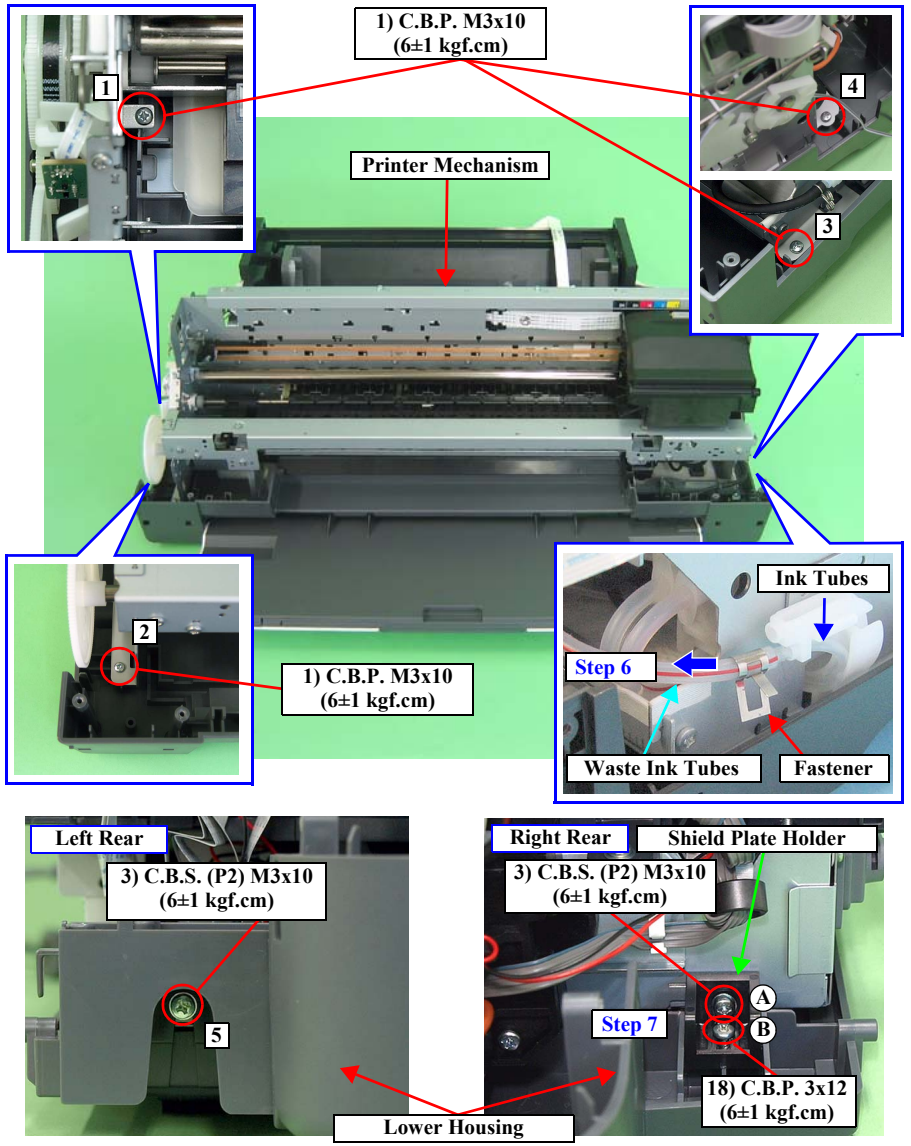


Figure 3-53. Screws that Secure the Printer Mechanism

REASSEMBLY

■ Install the Printer Mechanism to the Lower Housing as follows. (refer to Figure 3-53)

1. Align the two guide pins with the positioning holes as shown below.

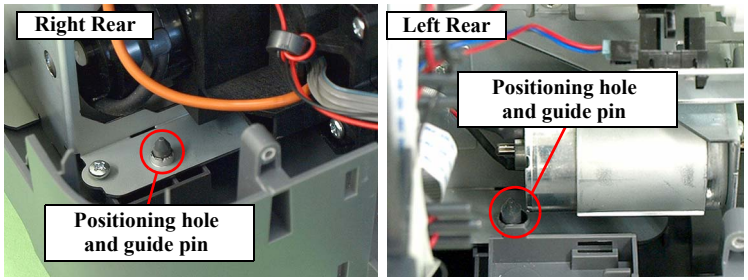


Figure 3-54. Reinstalling the Printer Mechanism

2. Place the Printer Mechanism on the Lower Housing and secure the Shield Plate Holder and the Printer Mechanism with the screw (A).
3. Verify the Printer Mechanism and Lower Housing are tightly engaged (no rattling), and then secure the Shield Plate Holder to the Lower Housing.
4. Secure the Printer Mechanism and Lower Housing with screws (x5). (Tighten the screws in the order shown in Figure 3-53)
5. Secure the electrode cable to the Front Paper Guide with the screw.

REASSEMBLY

■ Insert the Waste Ink Tube with the red line into the Ink Tube.

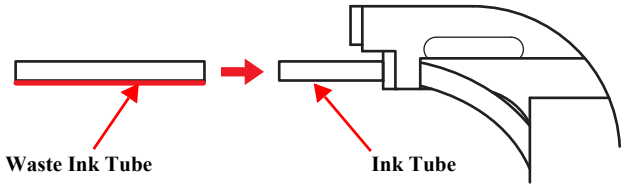


Figure 3-55. Installing the Ink Tubes

■ Make sure that the Waste Ink Tubes are not nipped by the Printer Mechanism.

ADJUSTMENT REQUIRED

After replacing the Printer Mechanism, always make the required adjustments referring to the following.

- "Chapter 4 Adjustment *(p.109)*"

3.4.5 Carriage Shaft / Carriage Unit

CHECK POINT

When only removing the Carriage Shaft, you do not need to perform "4.3.2 PG Adjustment (p124)". In that case, mark the position of the rib on the Parallelism Adjust Bushing (Left/Right) before removing them, and make sure to align the markings with the ribs when installing them.

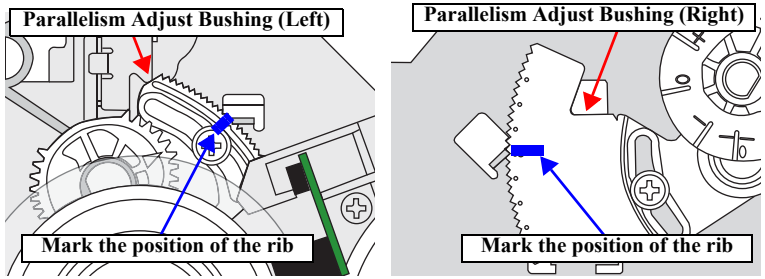


Figure 3-56. Marking Position

1. *Remove the Printhead / Adapter Guide Holder. (p.58)*
2. *Remove the CR Scale. (p.56)*
3. *Remove the APG Assy. (p.55)*
4. Rotate the PG Cam (Right) to adjust its positions other than PG++ downside.

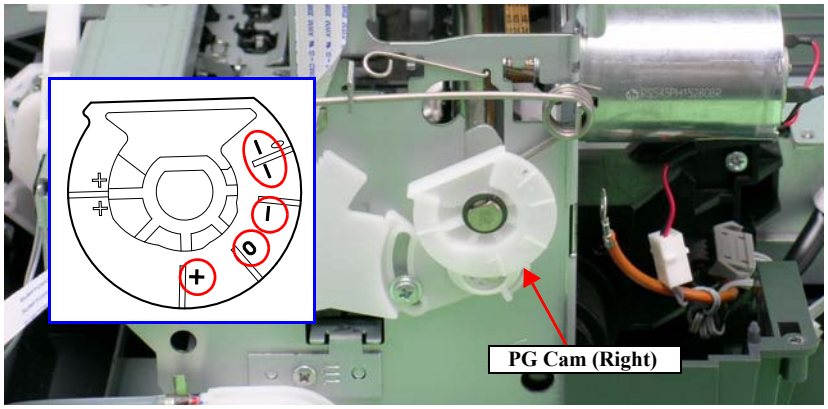


Figure 3-57. Adjusting the PG Cam

5. Remove the two C.B.S. M3 x 6 screws that secure the Frame Support Plate (Left), and remove it.

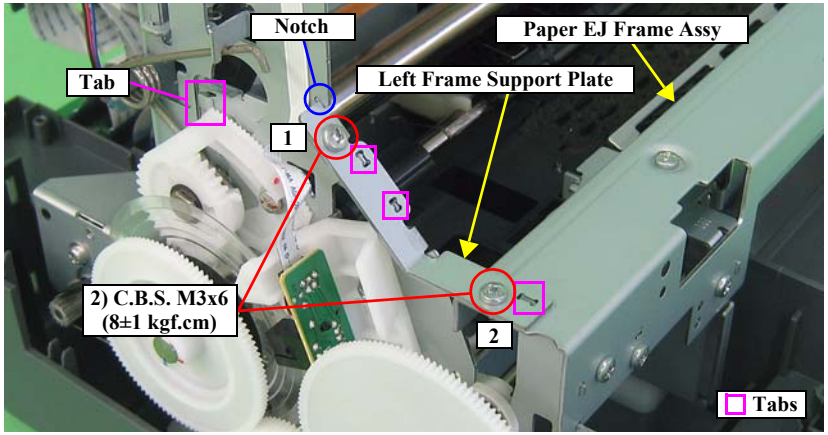


Figure 3-58. Removing the Left Frame Support Plate

REASSEMBLY

- **Insert the Left Frame Support Plate into the notch on the Main Frame. See Figure 3-58 (p.63)**
- **Align the two tabs on the Main Frame and the tab on the Paper EJ Frame Assy with the three positioning holes on the Frame Support Plate (Left). See Figure 3-58 (p.63)**
- **Align the tab (rear side) of the Left Frame Support Plate with the outside of the Left CR Shaft Mounting Plate. See Figure 3-58 (p.63)**
- **Tighten the screws in the order shown in Figure 3-58**

6. Remove the foot of Left PG Torsion Spring from tab A, and remove the coil section from tab B to remove Left PG Torsion Spring from the Main Frame.

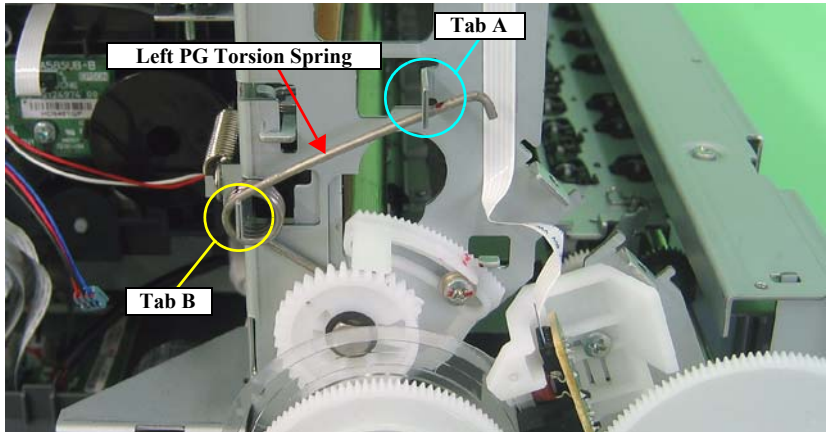


Figure 3-59. Removing the Left PG Torsion Spring

7. Remove the foot of Right PG Torsion Spring from tab A, and remove the coil section from tab B to remove the Right PG Torsion Spring from the Main Frame.

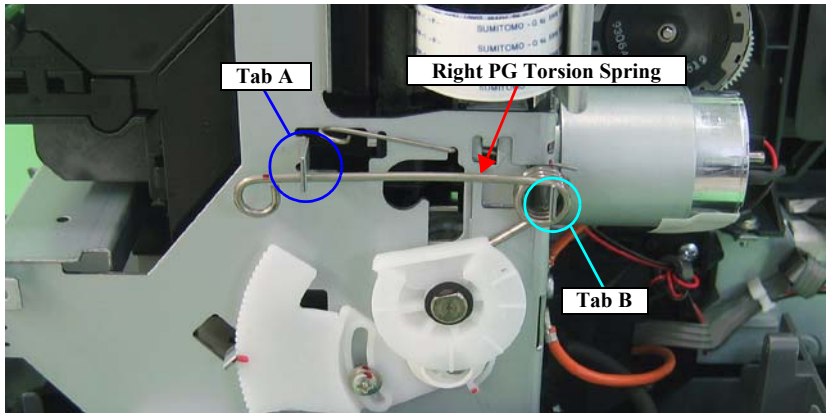


Figure 3-60. Removing the Right PG Torsion Spring

REASSEMBLY

Place the feet of Left PG Torsion Spring and Right PG Torsion Spring on the Carriage Shaft.

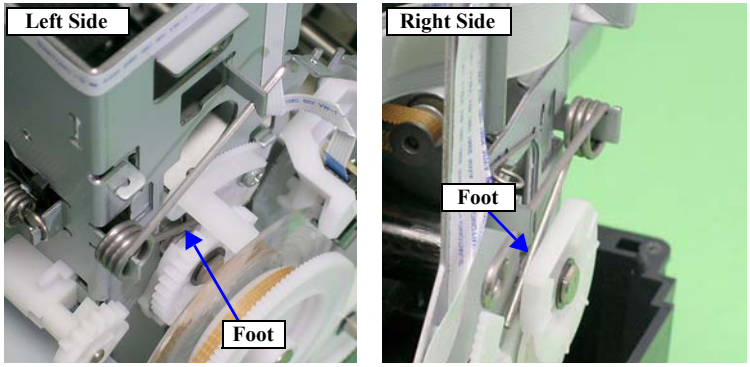


Figure 3-61. Reinstalling PG Torsion Springs

8. Remove CR Shaft Mounting Plate Fixed Spring from the tab and notch on the Main Frame, and pull out the spring in the direction of the arrow.

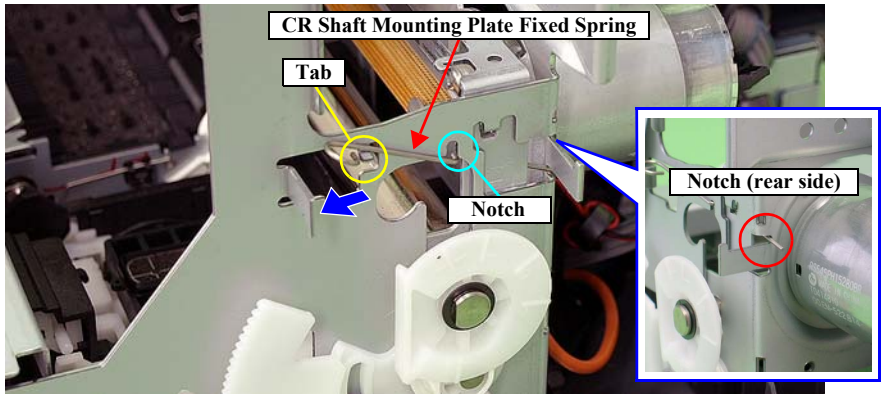


Figure 3-62. Removing CR Shaft Mounting Plate Fixed Spring

REASSEMBLY

Insert the foot of CR Shaft Mounting Plate Fixed Spring into the notch on the Main Frame (rear side). (See Figure 3-62 (p.64))

9. Remove the extension spring for the Driven Pulley Holder from the Main Frame and the tab on the Drive Pulley Holder with needle-nose pliers.

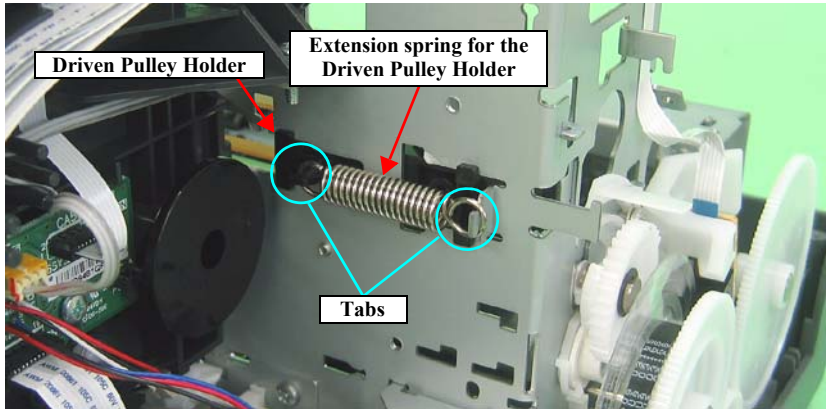


Figure 3-63. Removing the Extension Spring for the Driven Pulley Holder

10. Slide Driven Pulley Holder to the right end of the notch on the Main Frame, and Remove the Driven Pulley Holder toward you.

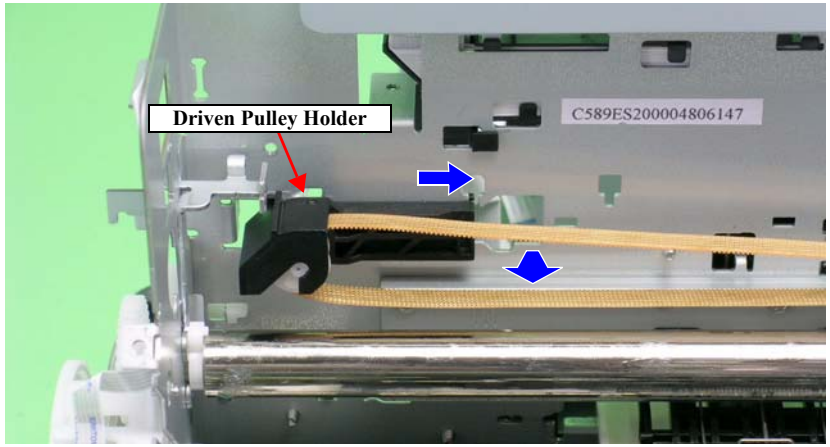


Figure 3-64. Removing the Driven Pulley Holder

11. Remove the CR Drive Belt from the CR Motor Pinion Gear.

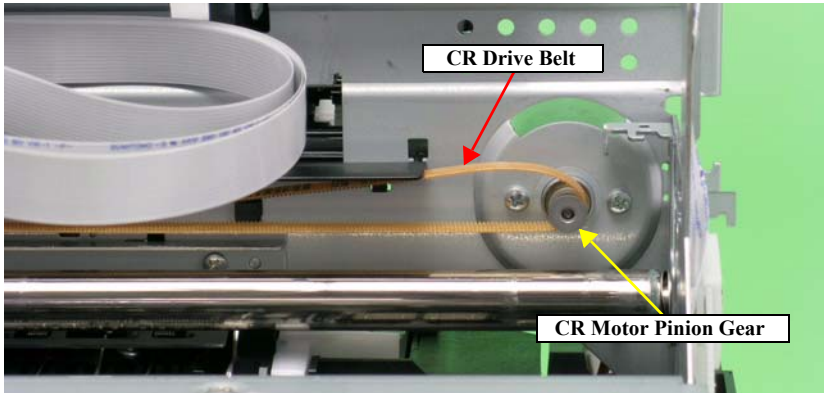


Figure 3-65. Removing the CR Drive Belt

12. Remove the four C.B.S. (P4) M3 x 6 screws that secure the CR Guide Plate, and remove it from the Main Frame.

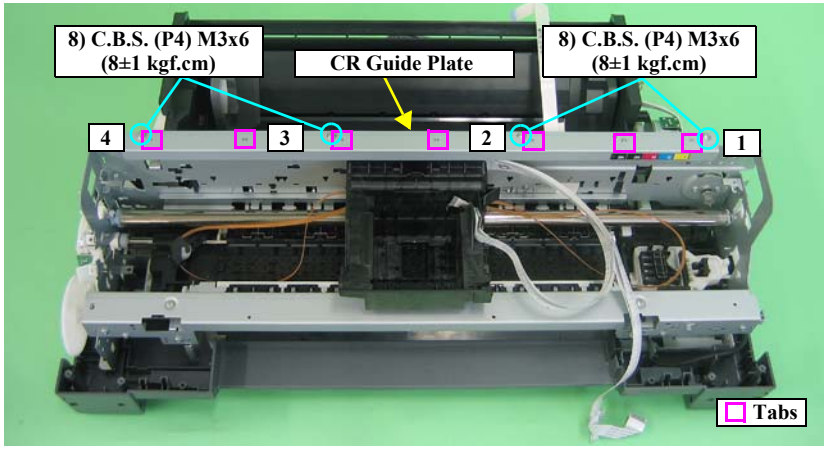


Figure 3-66. Removing the CR Guide Plate

REASSEMBLY

- **Align the positioning holes on the CR Guide Plate with the seven tabs on the Main Frame. See Figure 3-66 (p.65)**
- **Tighten the screws in the order shown in Figure 3-66.**

13. Loosen the C.B.S. (P4) M3 x 8 screw that secures the Left Parallelism Adjust Bushing, and rotate the Bushing toward the front of the Printer Mechanism to prevent interference between the Flag of the Parallelism Adjust Bushing and the Left PG Cam.

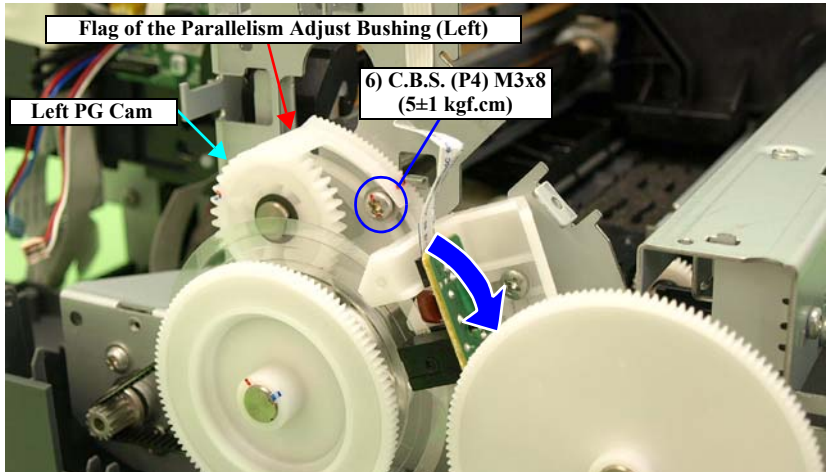


Figure 3-67. Rotating the Left Parallelism Adjust Bushing

14. Slide the Left CR Shaft Mounting Plate upwards, and release the tab on the Left CR Shaft Mounting Plate from the notch on the Main Frame to rotate the Mounting Plate toward you.

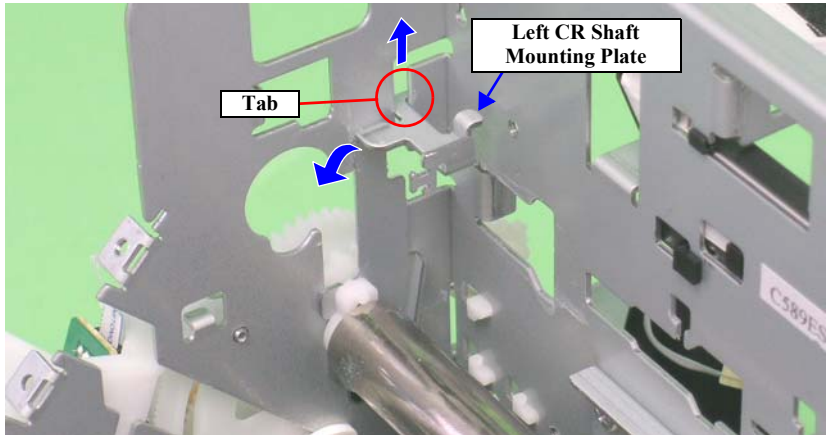


Figure 3-68. Rotating the Left CR Shaft Mounting Plate

15. Lift the Carriage Shaft upwards, and remove the Carriage Shaft Spacer from the Carriage Shaft with tweezers.

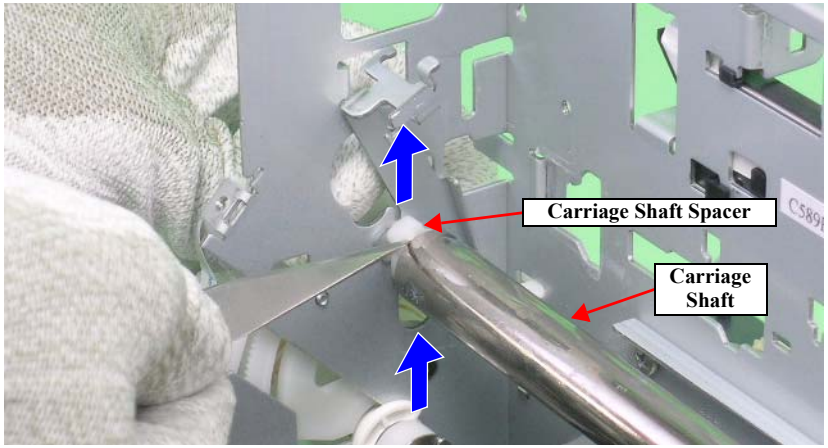


Figure 3-69. Removing the Carriage Shaft Spacer

16. Rotate the Left CR Shaft Mounting Plate toward you to remove the Bushing on the Left CR Shaft Mounting Plate from the Carriage Shaft.

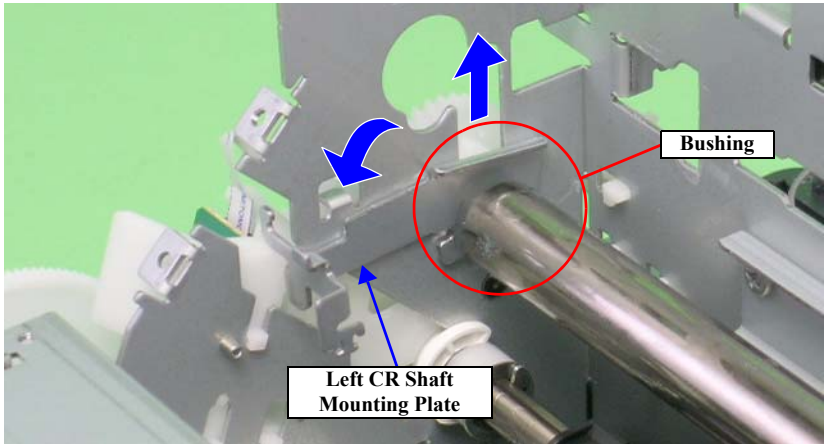


Figure 3-70. Removing the Left CR Shaft Mounting Plate

17. Lift the Carriage Shaft within the hole on the Main Frame, and remove the Spacer and Left PG Cam from the Carriage Shaft.

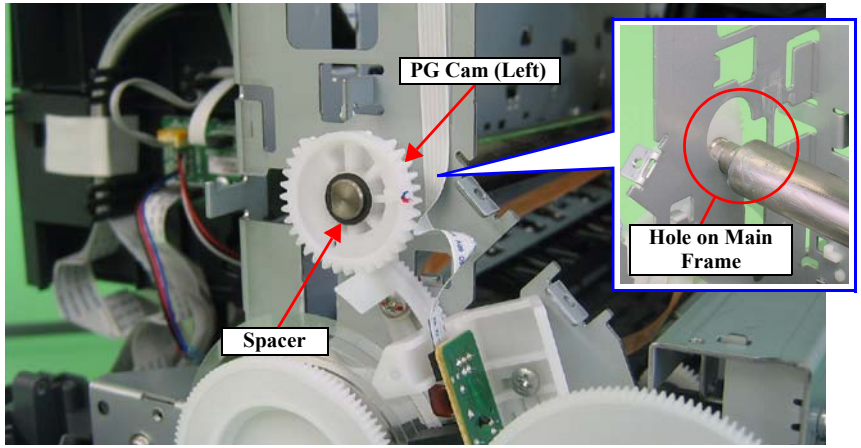


Figure 3-71. Removing Left PG Cam

18. Remove the Spacer and Right PG Cam from the Carriage Shaft.

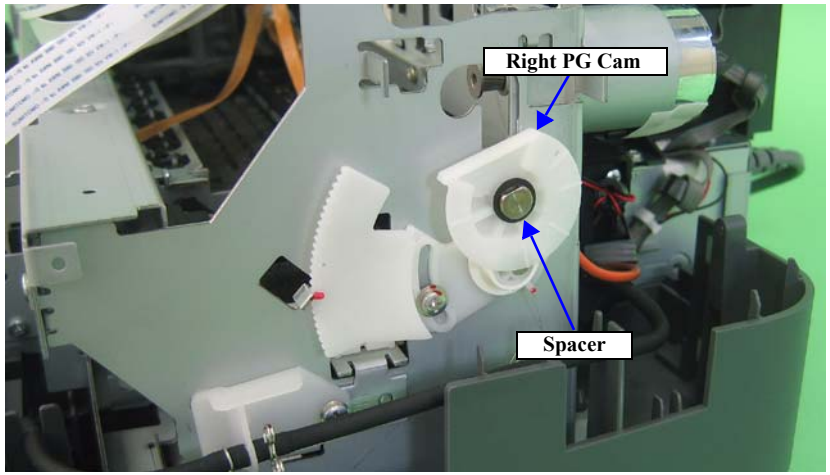


Figure 3-72. Removing Right PG Cam

Install the Right PG Cam so that one of these positions marked "0", "+" or "++" faces downward.

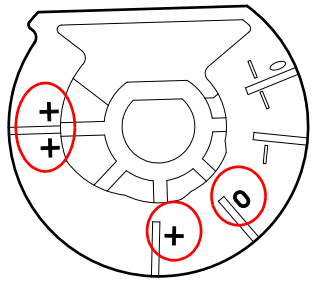


Figure 3-73. Right PG Cam Installation Direction

19. Pull the Right CR Shaft Mounting Plate away from the tab on the Main Frame and rotate toward you.

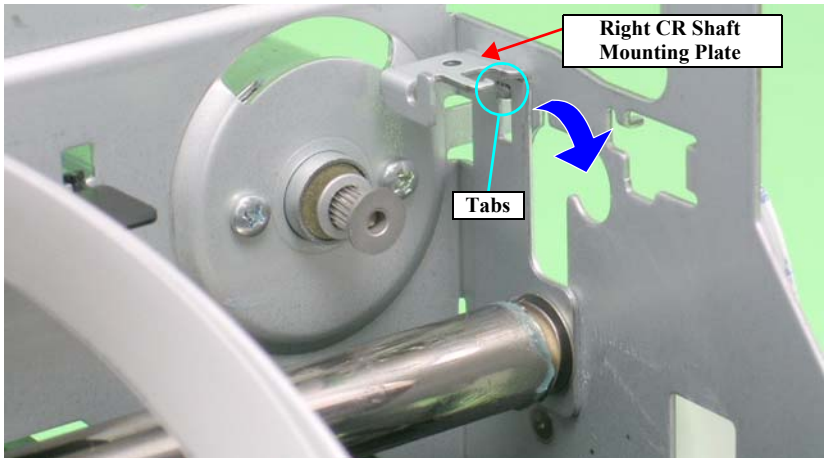


Figure 3-74. Rotating the Right CR Shaft Mounting Plate

CAUTION

When performing the following procedure, take care not to scratch the Carriage Shaft.

20. Slide the Carriage Unit to the left side to prevent the CR Scale Cover from interfering with the rear of the Carriage Unit, slide the Carriage Shaft to the left side and pull out its right end from the Main Frame, and pull out the Carriage Shaft from the Main Frame and Carriage Unit.

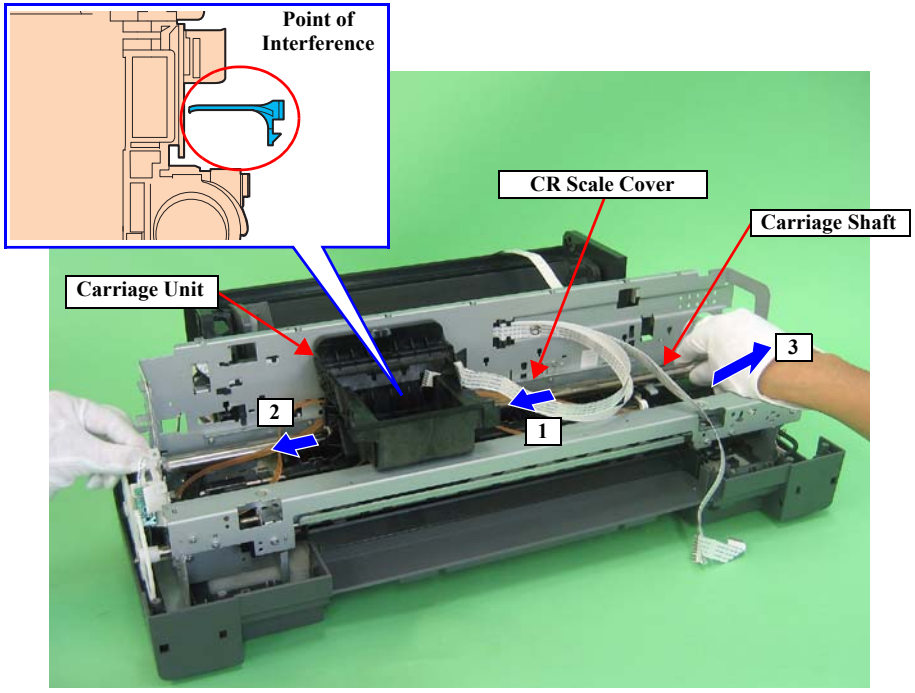


Figure 3-75. Removing the Carriage Shaft

REASSEMBLY

- **Set the longer end of the Carriage Shaft to the left side.**
- **When the Carriage Shaft is removed, the Plain spring and Leaf spring that are attached to the right end of the Carriage Shaft may drop off. In such case, be sure to attach them in the order as shown in the figure below.**

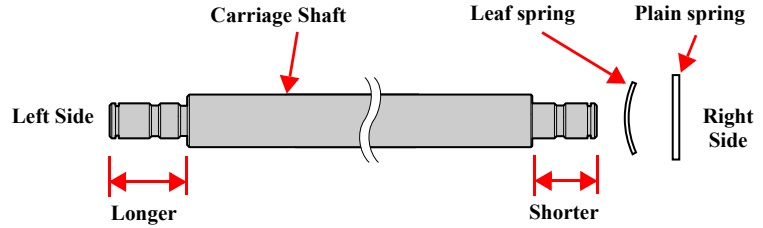


Figure 3-76. Reinstalling the Carriage Shaft

21. Insert the flathead screwdriver and such to the two holes of the Carriage Unit, and release the two tabs of the Ink Guide from the two hooks of the Carriage Unit, and then remove the Ink Guide upward.

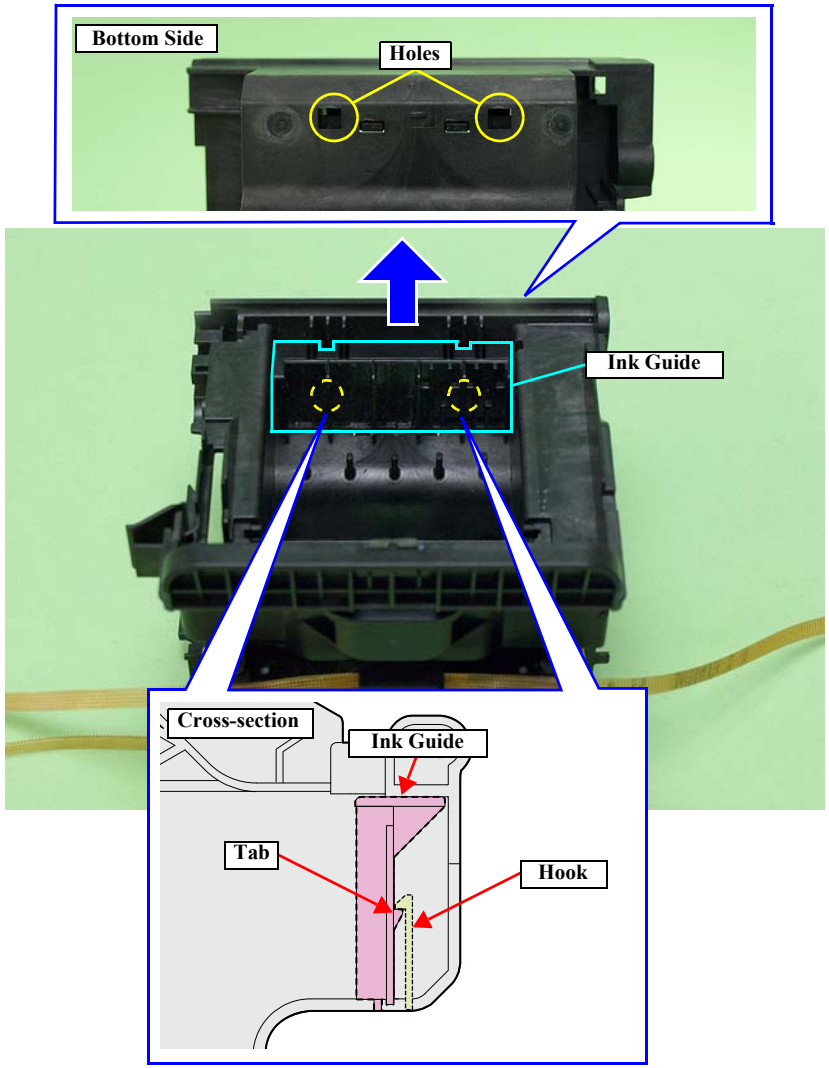


Figure 3-77. Removing the Ink Guide

22. Turn the Belt Holder Mounting Plate in the direction of the arrow, and remove it from the Carriage Unit.

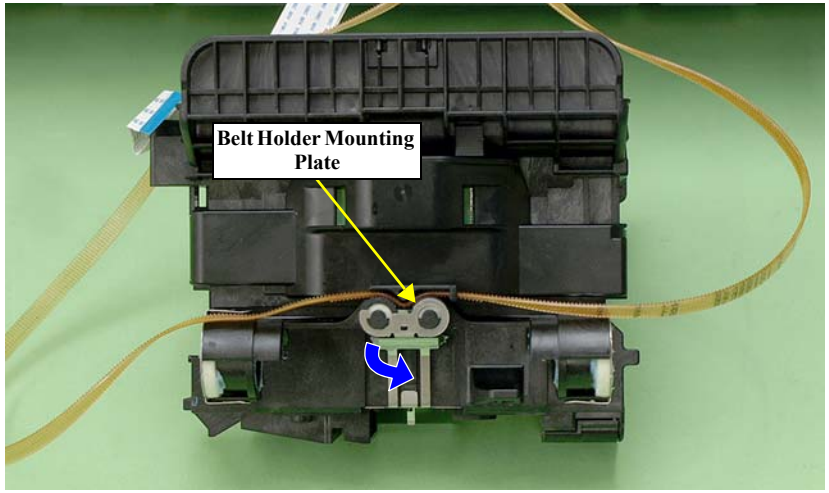


Figure 3-78. Removing the Belt Holder Mounting Plate

23. Remove the Belt Holder from the Carriage unit.

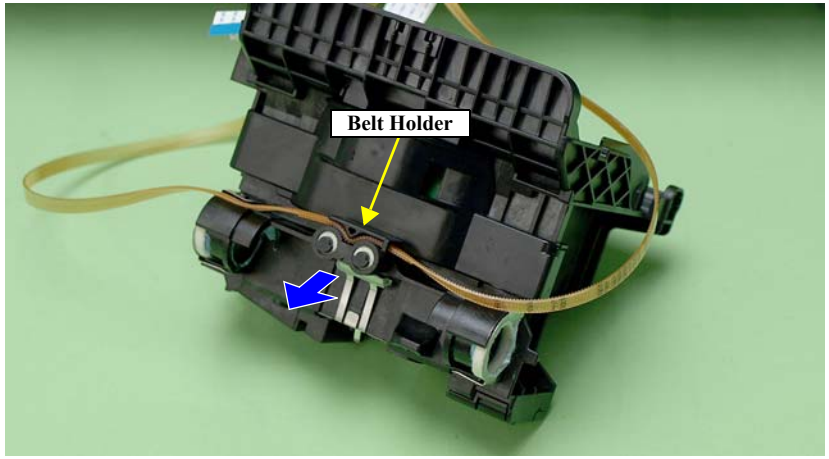


Figure 3-79. Removing the Belt Holder

24. Release the CR Encoder Board Holder from the three Tabs to remove it from the Carriage Unit.

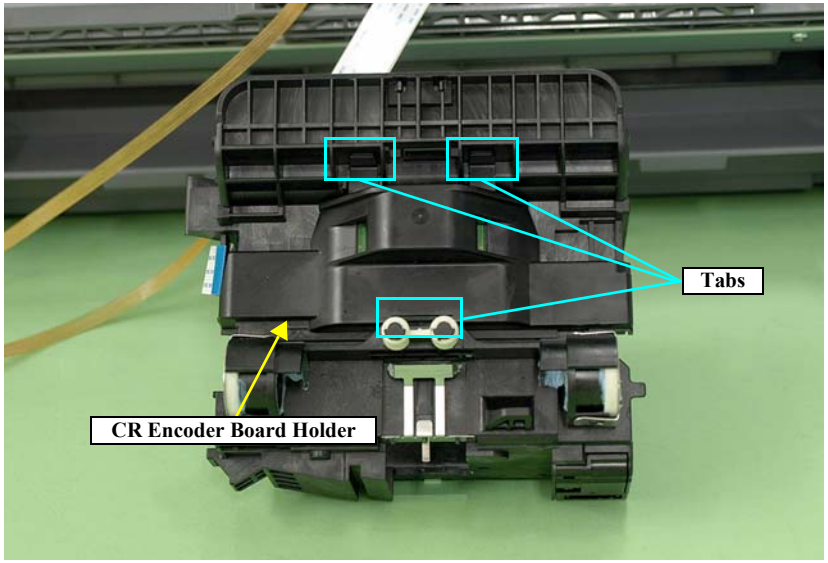


Figure 3-80. Removing the Belt Holder

25. Disconnect the Sensor FFC from the connector on the CR Encoder Board, pull out the Sensor FFC from the Carriage Unit, and remove the Carriage Unit.

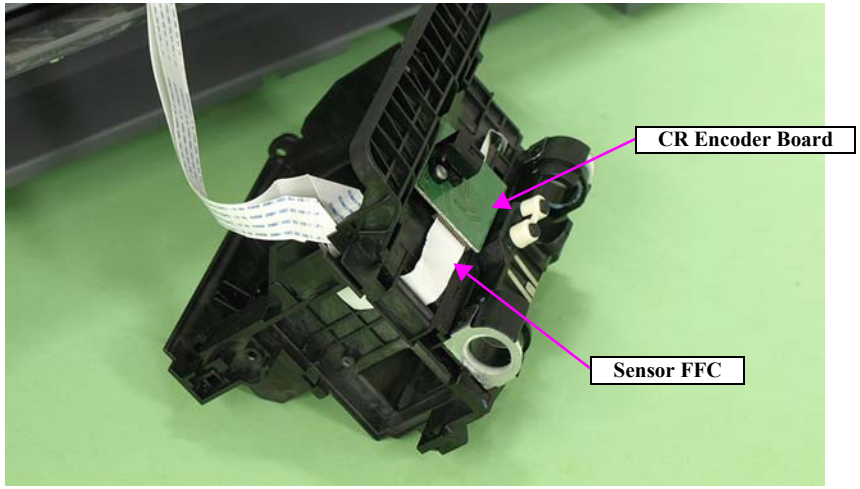


Figure 3-81. Removing the Carriage Unit

ADJUSTMENT REQUIRED

After replacing or removing the Carriage Shaft and Carriage Unit, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

ADJUSTMENT REQUIRED

After replacing or removing the Carriage Shaft and Carriage Unit, be sure to perform the required lubrication referring to below.

- **"Chapter 5 Maintenance *(p.133)*"**

3.4.6 ASF Assy

1. *Remove the Upper Housing Support Assy. (p.52)*
2. Remove the C.B.S. M3 x 8 screw that secures the Earth cables on the right rear side of the printer, and remove the Earth cables.
3. Disconnect the ASF Motor connector from the Relay connector.
4. Disconnect the Relay connector cable from the ASF Assy.

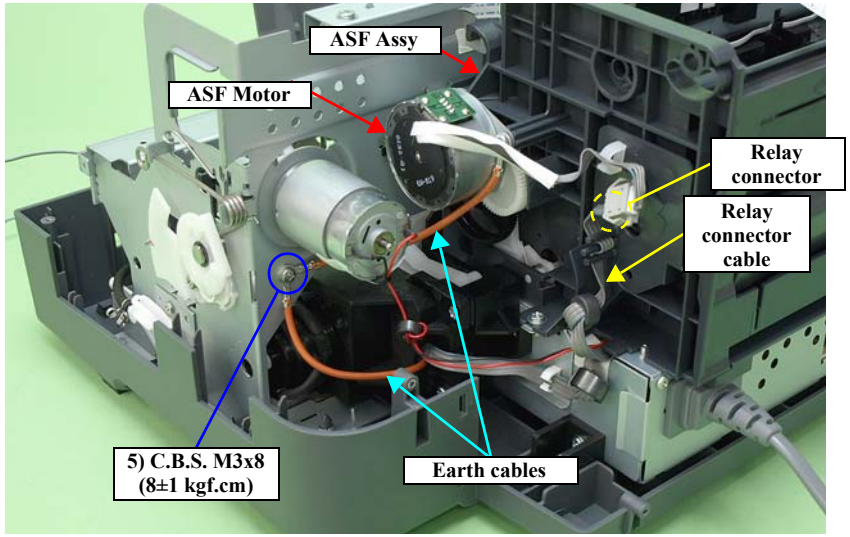


Figure 3-82. Releasing the Cables (1)

REASSEMBLY

- **Secure the two Earth cables together with the screw.**
- **Referring to Figure 3-82, correctly route the Relay connector cable.**

5. Disconnect all the cables and the FFCs from the connectors on the Relay Board.
   - CN1 : Relay FFC
   - CN2 : PE Sensor cable
   - CN6 : PF Encoder Sensor FFC
6. Peel off the acetate tape A and acetate tape B, and disconnect all the FFCs from the connectors on the Main Board, then release them from the ASF Assy.
7. Remove the APG Motor cable and PE Sensor cable from the ASF Assy.
8. Peel off the PF Encoder FFC secured by two pieces of double-sided adhesive tape from the ASF Assy.

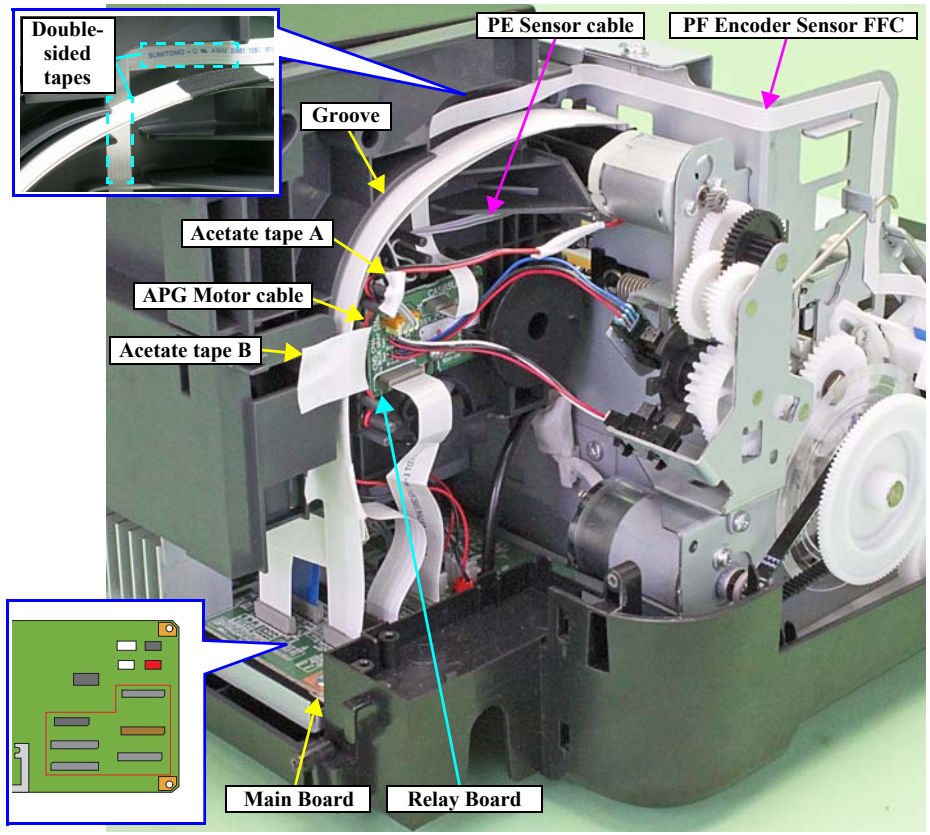


Figure 3-83. Releasing the Cables (2)

REASSEMBLY

- **Referring to Figure 3-83, correctly route each of the cables and FFCs.**
- **Apply the acetate tape A according to the standard below.**

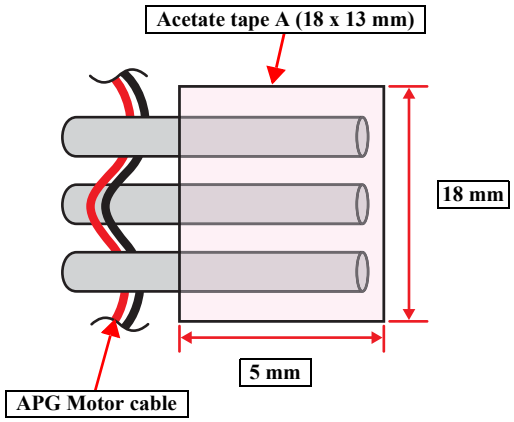


Figure 3-84. Applying the Acetate tape A

CHECK POINT

When only removing the ASF Assy, you do not need to perform "4.3.5 ASF Guide Roller LDs Position Adjustment (p131)". In that case, mark the installing positions of the Guide Roller LDs before removing them, and make sure to align the markings when installing the Guide Roller LDs.

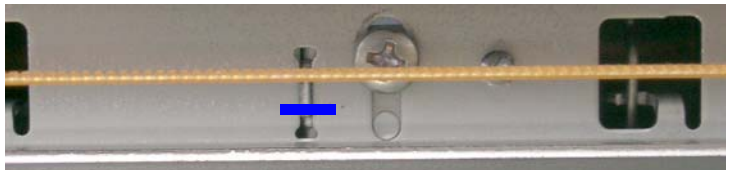


Figure 3-85. Marking Position

9. Remove the two C.B. M3 x 6 screws that secure the two Guide Roller LDs.
10. Gently pull the LD Roller Shaft to the rear of the printer, and remove the Guide Roller LDs.

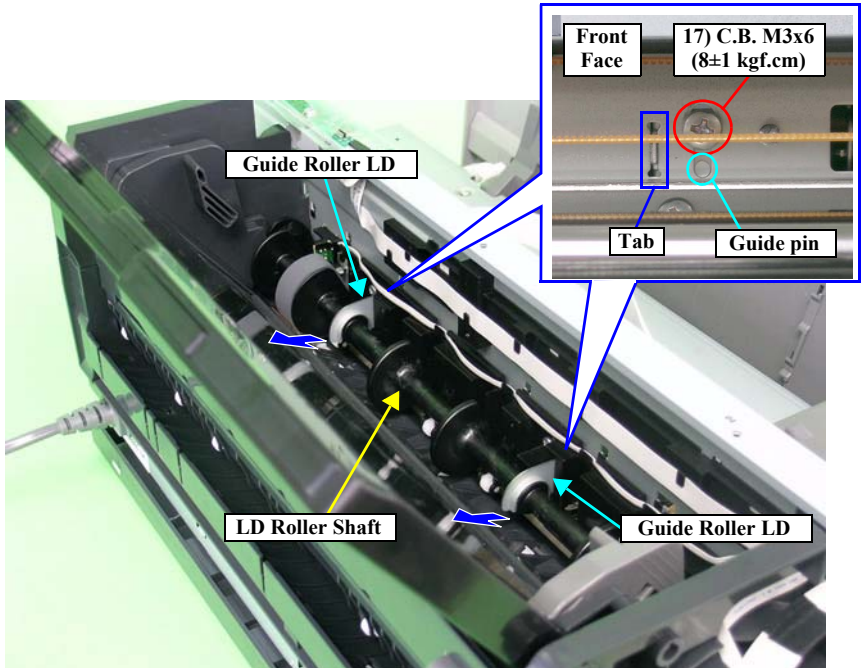


Figure 3-86. Removing the Guide Roller LD

REASSEMBLY

Align the guide pins and tabs on the Guide Roller LDs with the positioning holes on the Main Frame. (Refer to Figure 3-86.)

11. Remove the three C.B.S. (P4) M3 x 8 screws that secure the ASF Assy, and remove the ASF Assy from the Printer Mechanism.

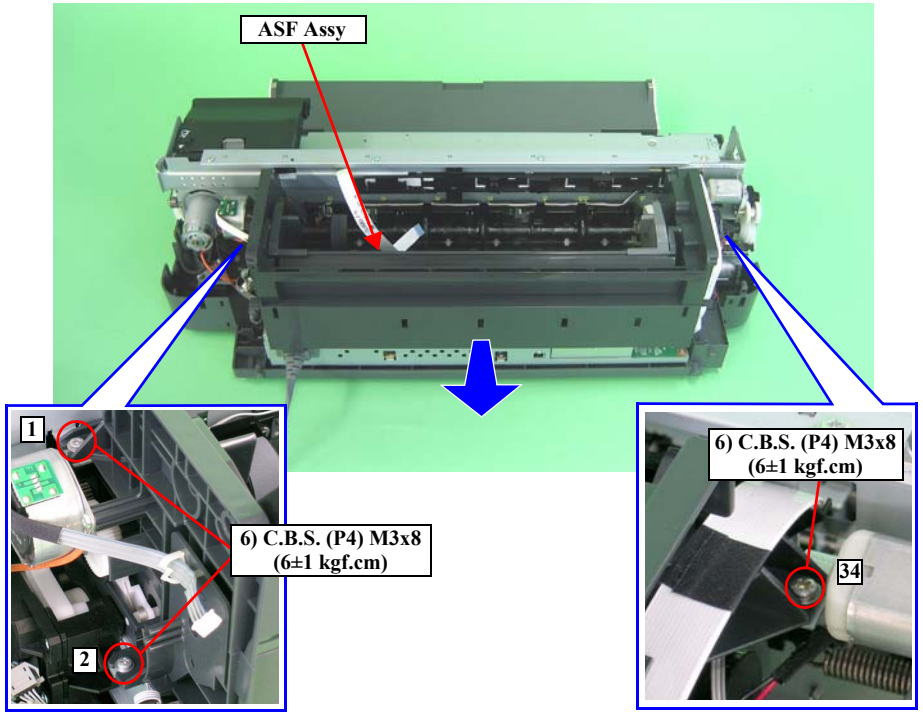


Figure 3-87. Removing the ASF Assy

REASSEMBLY

- **Align the guide pin and four Tabs on the ASF Assy with the positioning holes on the Main Frame so that there is no gap between the ASF Assy and the Main Frame.**

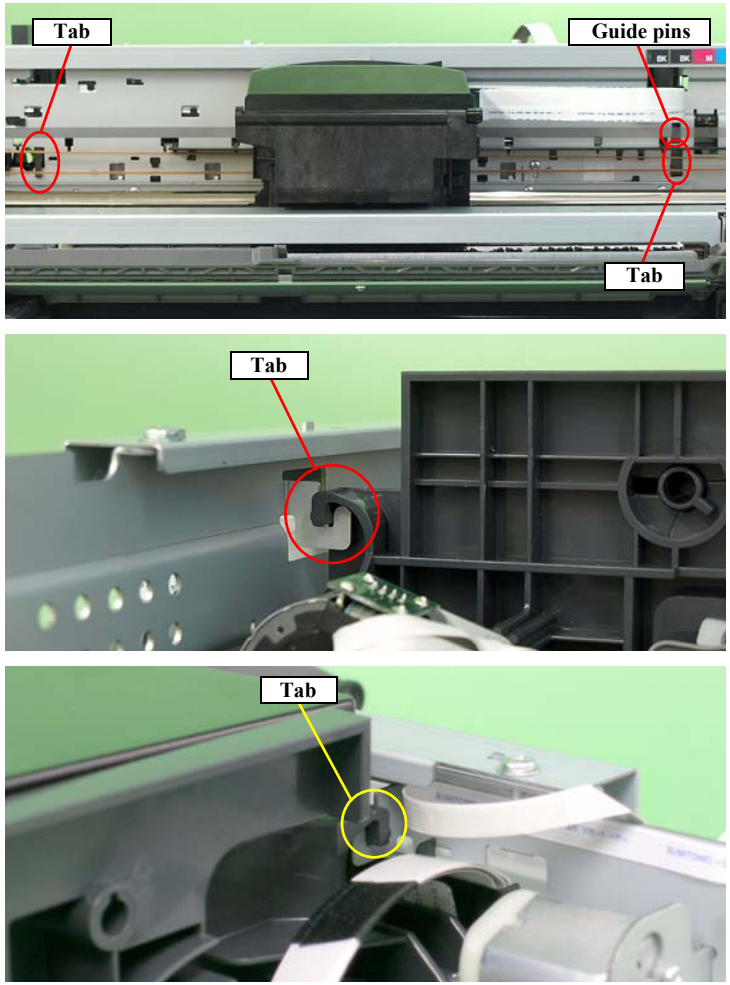


Figure 3-88. Reinstalling the ASF Assy

- **Tighten the screws in the order shown in Figure 3-87.**

ADJUSTMENT REQUIRED

After replacing or removing the ASF Assy, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

3.4.7 LD Roller

CHECK POINT

When replacing the LD Roller, replace the Retard Roller Assy together with the LD Roller. *(Refer to 3.4.8 Retard Roller Assy (p.76).)*

1. *Remove the ASF Assy. (p.71)*
2. *Remove the ASF Motor. (p.96)*
3. Remove the Combination Gear 29,11 from the ASF Assy.
4. Release the tab that secure the LD Spur Gear, and remove the LD Spur Gear from the LD Roller Shaft.

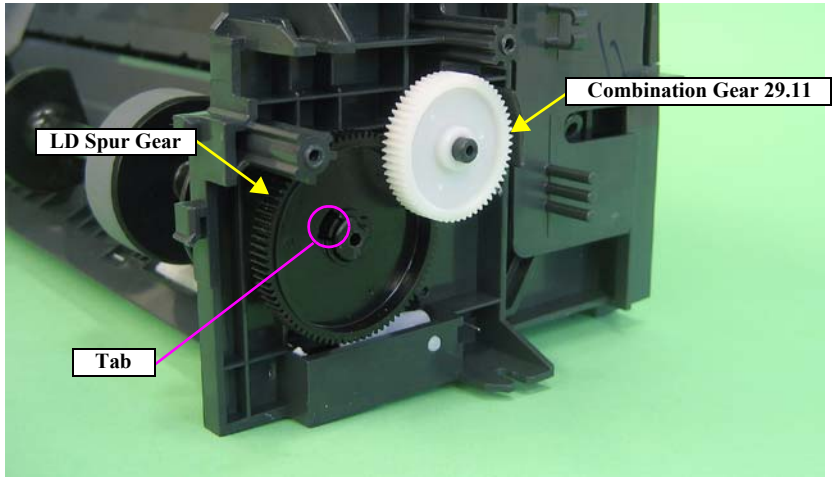


Figure 3-89. Removing the LD Roller (1)

5. Release the two tabs that secure the ASF Sensor Flag from the inside of the ASF Assy, and remove the ASF Sensor Flag from the LD Roller Shaft.

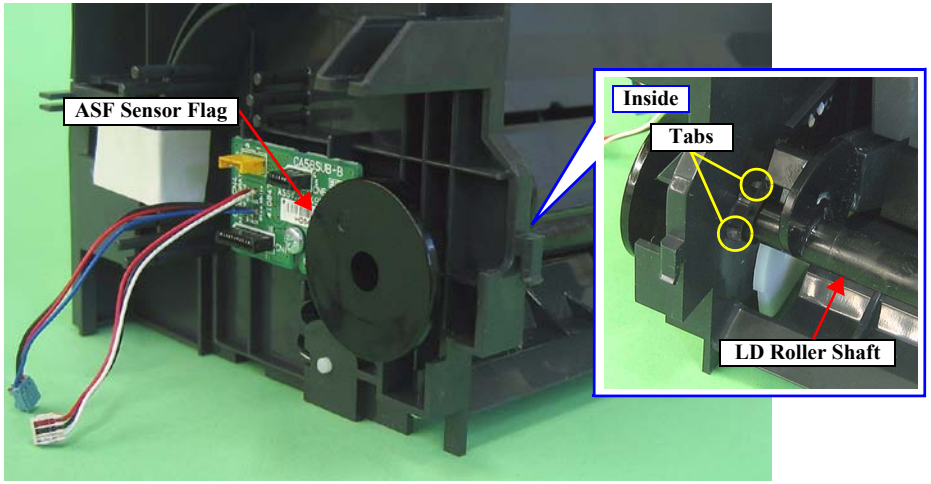


Figure 3-90. Removing the LD Roller (2)

6. Remove the C.B.P. M3 x 8 screw that secure the ASF Support Plate from the bottom side of the ASF Assy, and remove the ASF Support Plate from the ASF Assy.

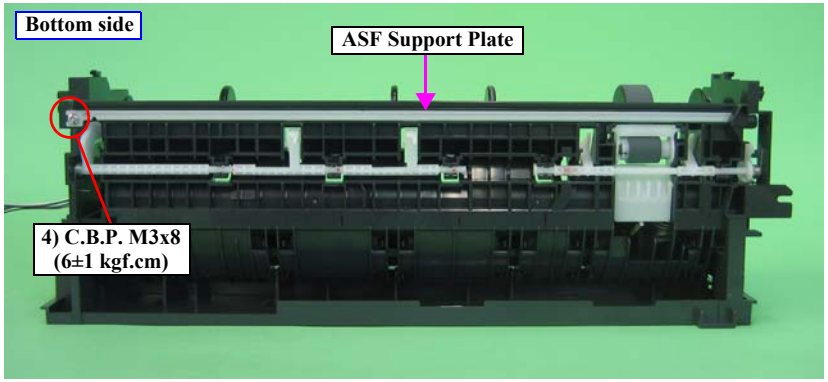


Figure 3-91. Removing the LD Roller (3)

7. While bending the LD Roller Shaft slightly, detach it from the shaft hole on the left side of the ASF Assy, and remove the LD Roller Shaft.
8. Remove the LD Roller from the LD Roller Shaft.

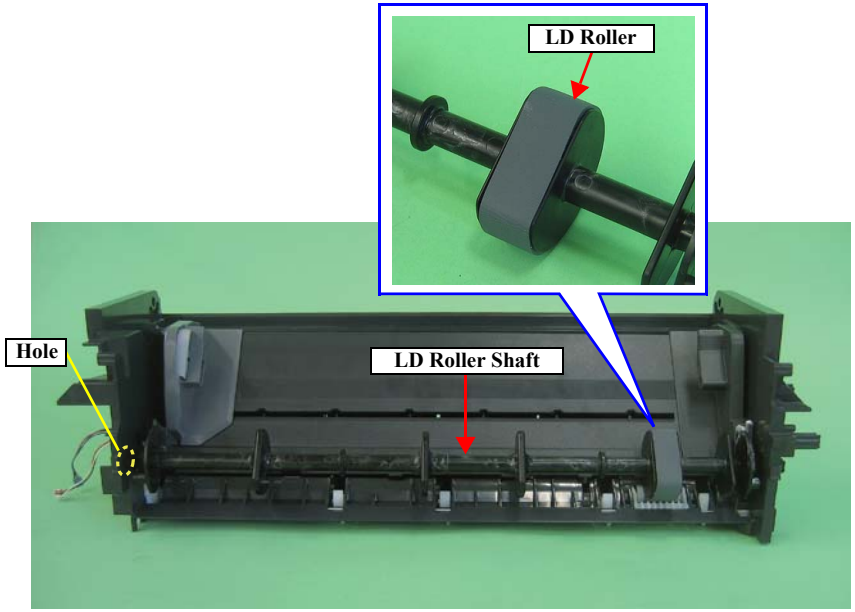


Figure 3-92. Removing the LD Roller (4)

REASSEMBLY

- **Make sure to install the LD Roller with the triangular groove marked inside as shown below.**

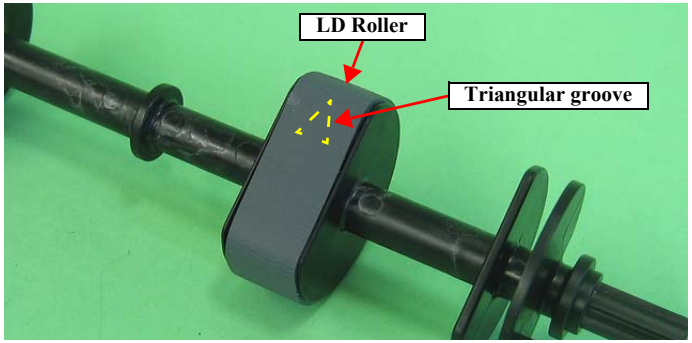


Figure 3-93. Reinstalling the LD Roller

- **Align the phases of the ASF Sensor Flag and LD Roller Shaft as shown below.**

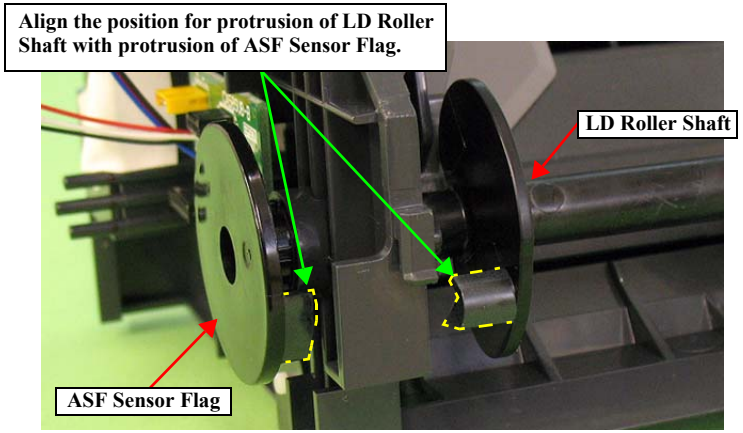


Figure 3-94. Reinstalling the ASF Sensor Flag

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-26 and G-75 grease to the area specified for each part.

- **ASF Frame:See Figure 5-15 on page 140.**
- **LD Roller Shaft: See Figure 5-16 on page 140.**
- **Hopper: See Figure 5-17 on page 140.**

3.4.8 Retard Roller Assy

CHECK POINT

When replacing the Retard Roller Assy, replace the LD Roller together with the Retard Roller Assy. *(Refer to 3.4.7 LD Roller (p.74).)*

1. *Remove the ASF Assy. (p.71)*
2. Release the Paper Back Lever Right from the two grooves of the ASF Assy.
3. Release the shaft end of the Paper Back Lever Right, and remove the Paper Back Lever Right and the torsion spring from the ASF Assy.

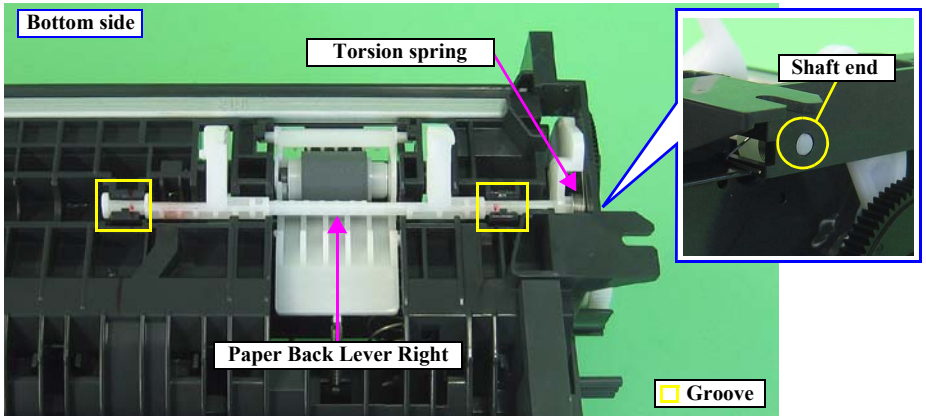


Figure 3-95. Removing the Retard Roller Assy (1)

4. Detach the extension spring from the tab of the Retard Roller Assy, and remove the Retard Roller Assy from the ASF Assy.

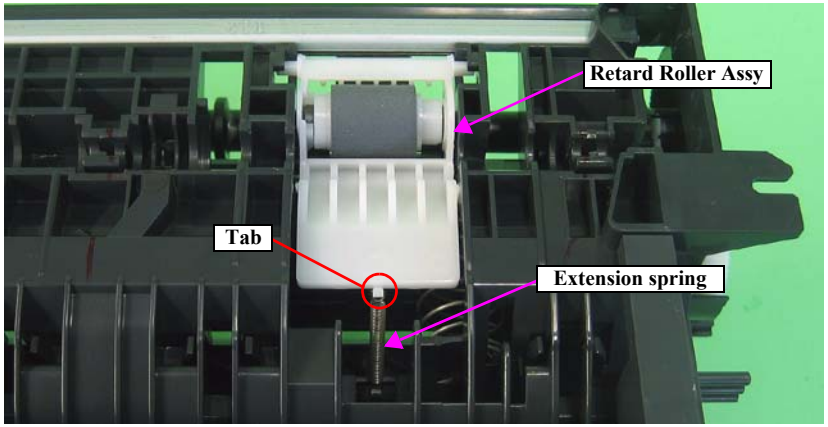


Figure 3-96. Removing the Retard Roller Assy (2)

REASSEMBLY

■ **Insert the two shafts of the Retard Roller Assy to the two holes of the ASF Assy.**

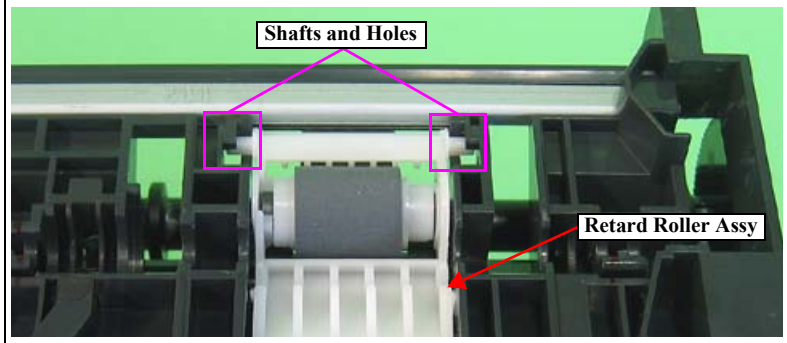


Figure 3-97. Reinstalling the Retard Roller Assy

REASSEMBLY

■ **See below for installing the torsion spring of the Paper Back Lever Right.**

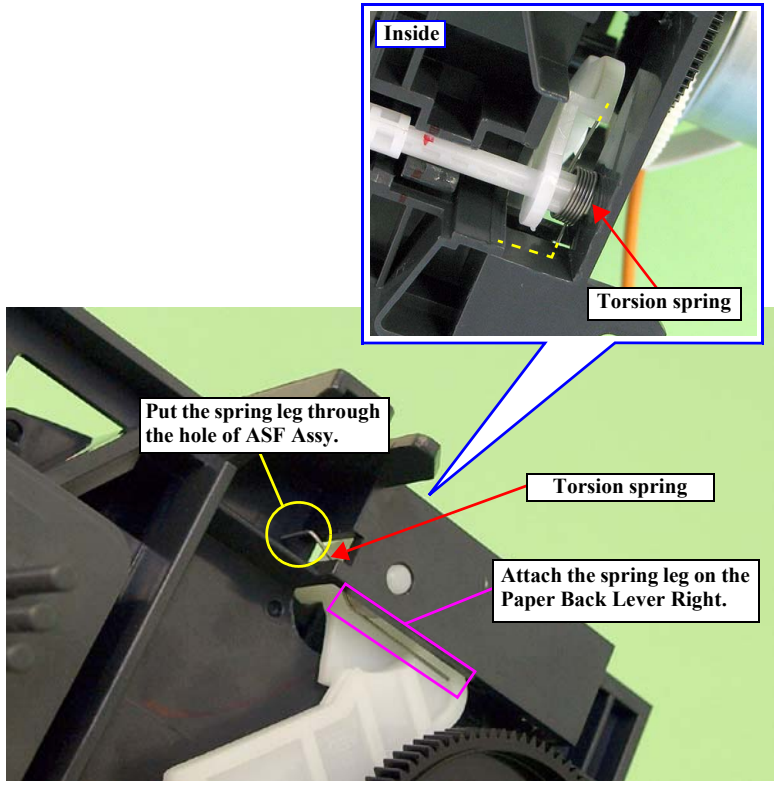


Figure 3-98. Reinstalling the Torsion Spring

3.4.9 Front Paper Guide Pad

1. Remove the Printer Mechanism. *(Refer to 3.4.4 Lower Housing / Printer Mechanism (p.61).)*
2. Remove the Front Paper Guide Pads from the Front Paper Guide with tweezers.

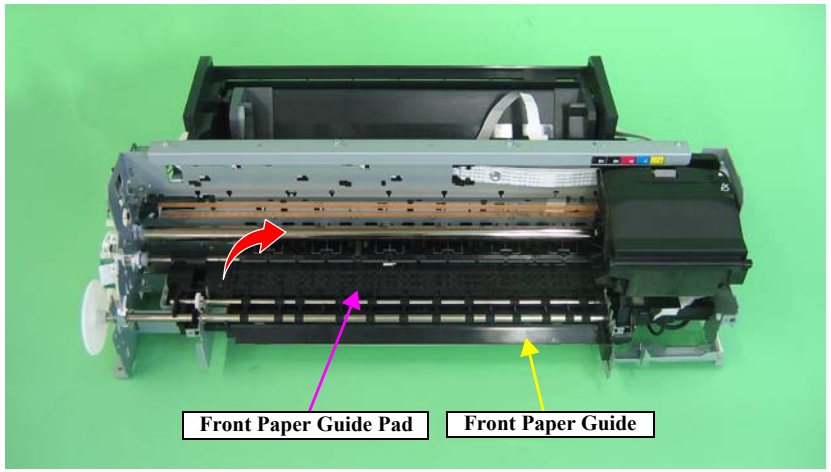


Figure 3-99. Removing the Front Paper Guide Pad

CAUTION

Take care to prevent the grease contained on the Front Paper Guide Pads from sticking to other parts.

REASSEMBLY

After installing the Front Paper Guide Pads, lift the Printer Mechanism, and check the following points.

1. **Make sure that the tabs on the Pads are not cut midway.**
2. **Make sure that all tabs are in place on the Front Paper Guide, and that they are facing down (towards the Waste Ink Pads) without any folds.**
3. **Make sure that the tab foldbacks are protruding completely from the Front Paper Guide.**

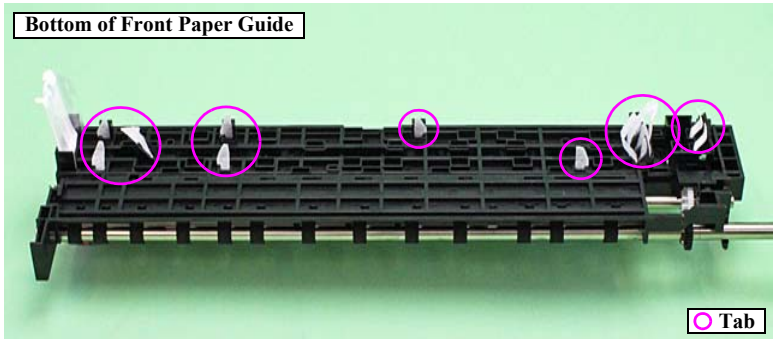


Figure 3-100. Reinstalling the Front Paper Guide Pad (1)

4. **Make sure that the pad is placed under a tab of the Front Paper Guide.**

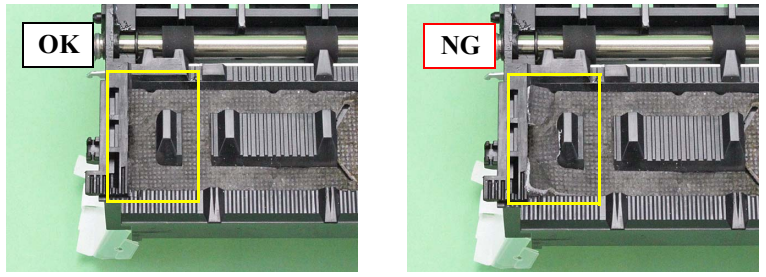


Figure 3-101. Reinstalling the Front Paper Guide Pad (2)

5. **Make sure that all the tabs on the pads are fitted into the securing section under the Front Paper Guide.**

3.4.10 Waste Ink Pad

1. Remove the Printer Mechanism. *(Refer to 3.4.4 Lower Housing / Printer Mechanism (p.61).)*
2. Remove the C.B.P. 3x8 screw that secures the Waste Ink Tube.
3. Remove the 11 Waste Ink Pads from the Lower Housing.

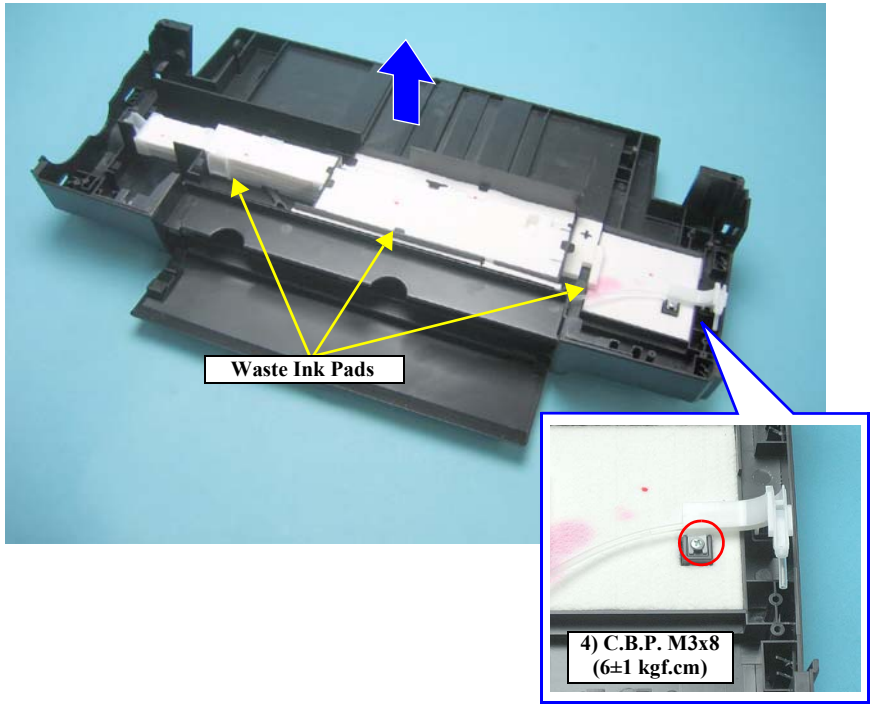


Figure 3-102. Removing the Waste Ink Pads

■ **Route the Waste Ink Tube as shown below.**

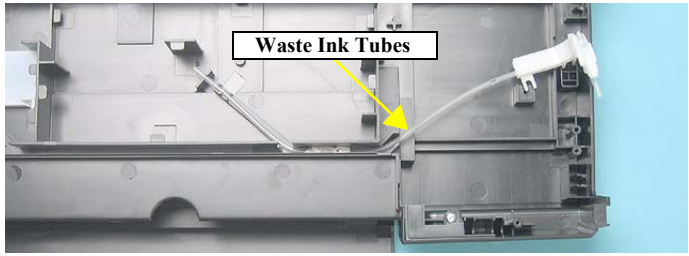


Figure 3-103. Positions of Waste Ink Tubes

■ **Referring to Figure 3-104, correctly install the Waste Ink Pads.**

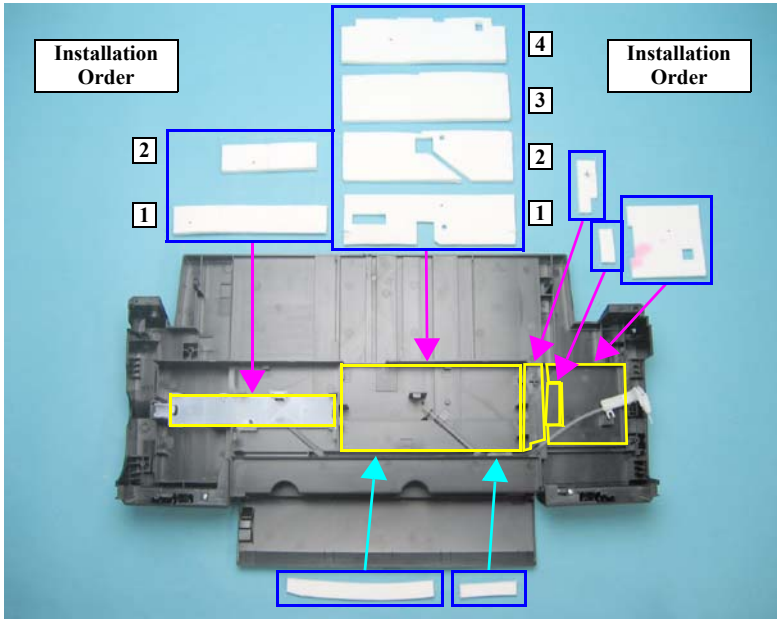


Figure 3-104. Installing the Waste Ink Pads

ADJUSTMENT REQUIRED

After replacing or removing the Waste Ink Pads and the Waste Ink Pad, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

3.4.11 Foot

1. Remove the Printer Mechanism. *(Refer to 3.4.4 Lower Housing / Printer Mechanism (p.61).)*
2. Remove the six foot at the backside of the Lower Housing.

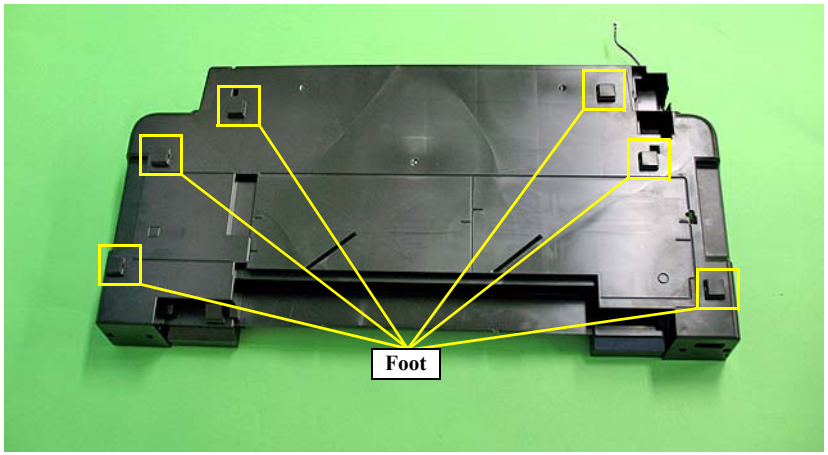


Figure 3-105. Removing the Foot

3.4.12 Paper EJ Frame Assy

1. *Remove the Upper Housing Support Assy. (p.52)*
2. *Remove the Ink Supply Tube Assy section. (p.102)*
3. *Remove the Ink Supply Tank Tube Assy section. (p.104)*
4. Remove the Left Frame Support Plate. *(Refer to 3.4.5 Carriage Shaft / Carriage Unit Step4 (p63), Step5(p63).)*
5. Return the rotation position of the Right PG Cam.
6. Remove the four C.B.S. M3 x 6 that secure the Paper EJ Frame Assy.

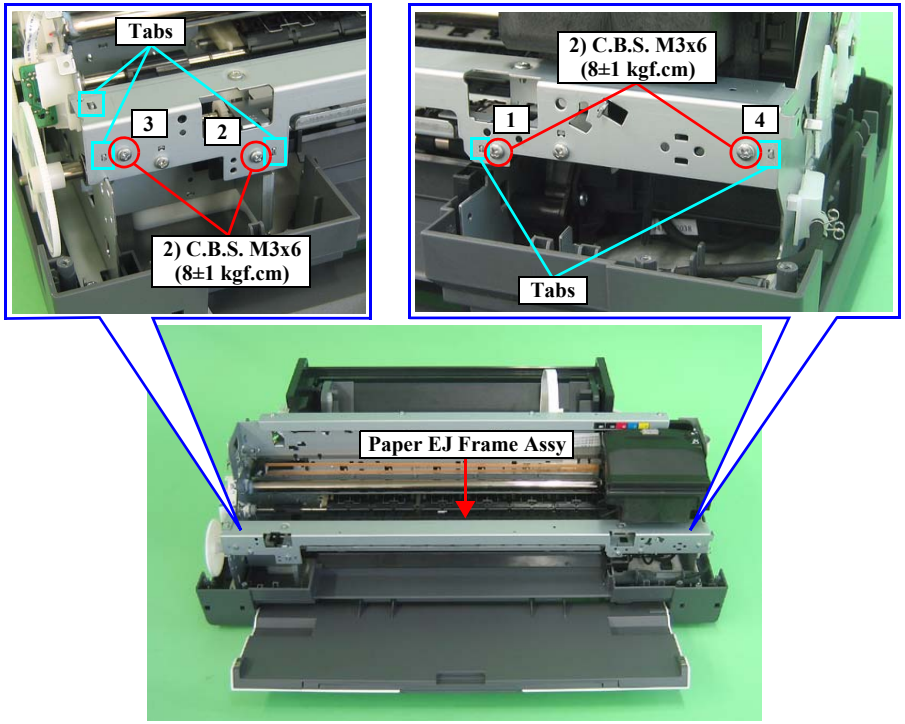


Figure 3-106. Screws that Secure the Paper EJ Frame Assy

CAUTION

When performing the following procedure, take care not to scratch the Star Wheel.

7. Pull frontward the Paper EJ Frame Assy and remove it from the Printer Mechanism.

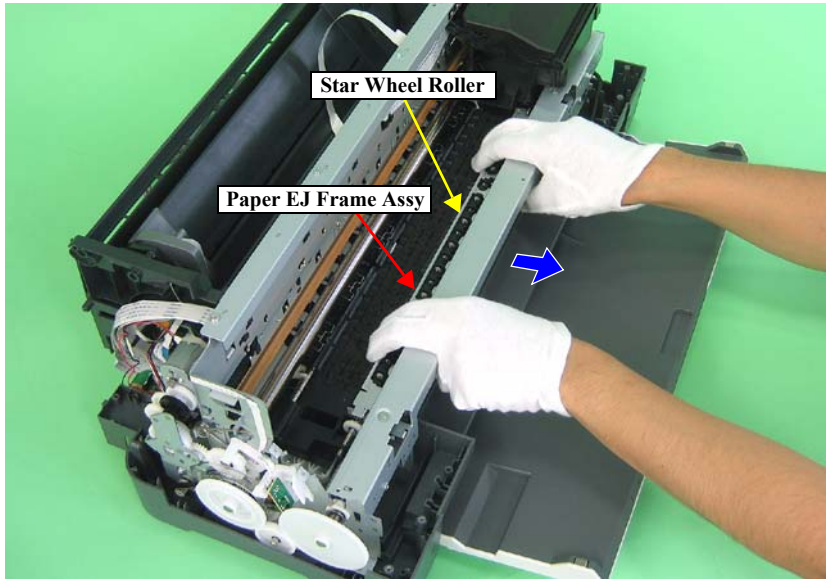


Figure 3-107. Removing the Paper EJ Frame Assy

REASSEMBLY

- **Hook both rear ends of the Paper EJ Frame Assy onto the tabs on the Main Frame.**

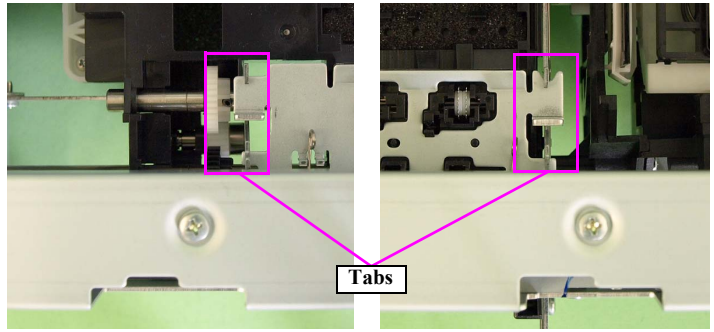


Figure 3-108. Reinstalling the Paper EJ Frame Assy

- **Align the tabs with the five positioning holes.**
  See Figure 3-106 (p.80)
- **Tighten the screws in the order shown in Figure 3-106**

ADJUSTMENT REQUIRED

After replacing or removing the Paper EJ Frame Assy, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

3.4.13 Ink System Unit

1. *Remove the ASF Assy. (p.71)*
2. *Remove the Paper EJ Frame Assy. (p.80)*
3. *Remove the Lower Housing / Printer Mechanism. (p.61)*
4. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 3.1.6 Locking/Releasing the Carriage (p.41).)*
5. Release the two tabs that secure the clamps to the Upper Shield Plate, and remove the two clamps.
6. Disconnect the Pump Motor cable from the connector CN117 on the Main Board.
7. Remove the Pump Motor cable from the Cord Keep.

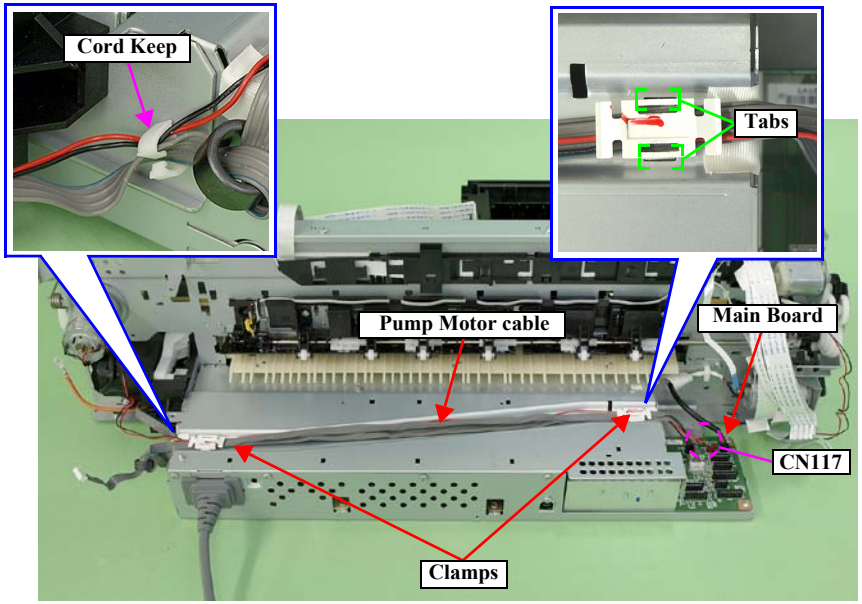


Figure 3-109. Removing the Pump Motor cable

REASSEMBLY

- **Referring to Figure 3-140, attach two pieces of acetate tape to the frame.**
- **Referring to Figure 3-141, route the Pump Motor cable, the Relay connector cable and the CR Motor connector cable.**

8. Remove the two C.B.S. M3 x 4 screws that secure the Ink System Guide Plate, and remove it.

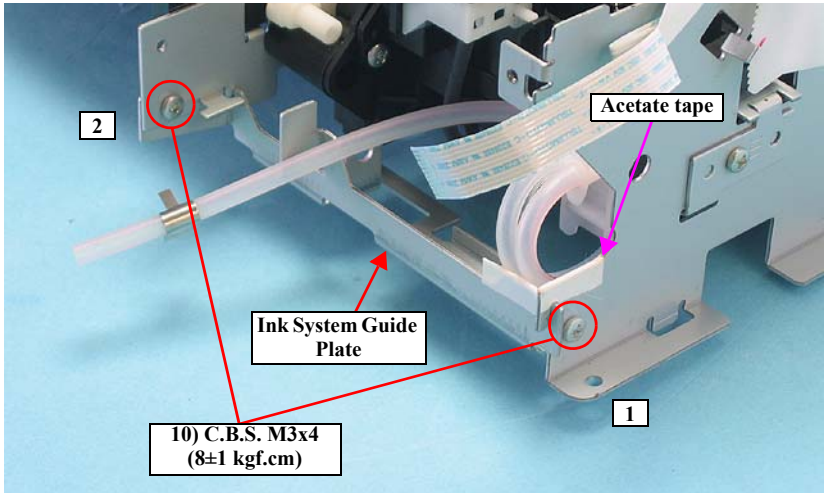


Figure 3-110. Removing the Ink System Guide Plate

REASSEMBLY

- **Align the notch on the Ink System Guide Plate with the notch on the Main Frame.**
- **Referring to Figure 3-110 and Figure 3-111, attach a piece of acetate tape.**

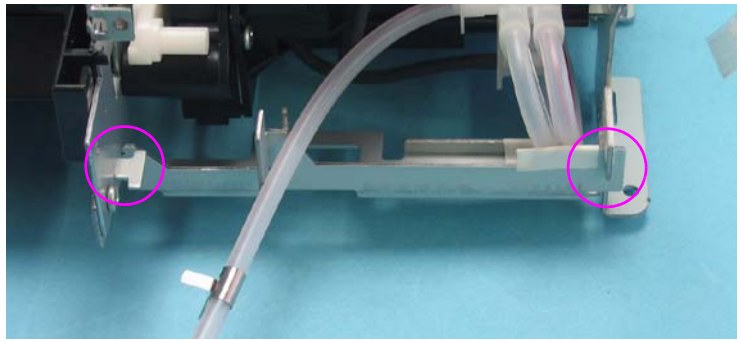


Figure 3-111. Reinstalling the Ink System Guide Plate

- **Tighten the screws in the order shown in Figure 3-110**

9. Remove the two C.B.S. M3 x 6 screws that secure the Ink System Unit.

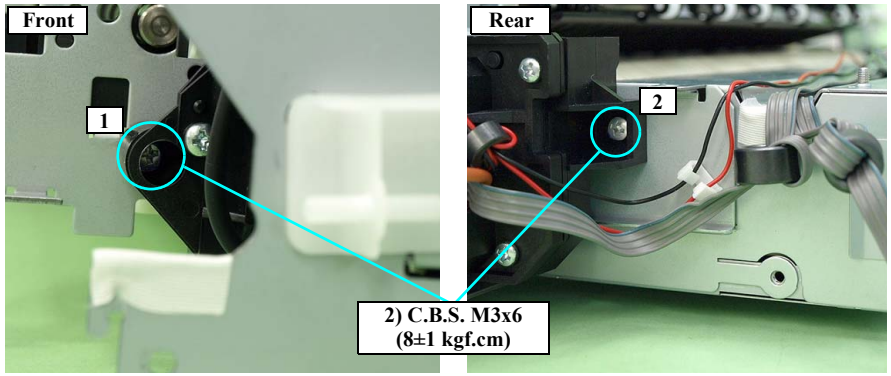


Figure 3-112. Screws that Secure the Ink System Unit

REASSEMBLY

Tighten the screws in the order shown in Figure 3-112

10. Remove the two C.B.S. 3x6 screws that secure the Right Support Frame, and remove the Right Support Frame from the Main Frame.

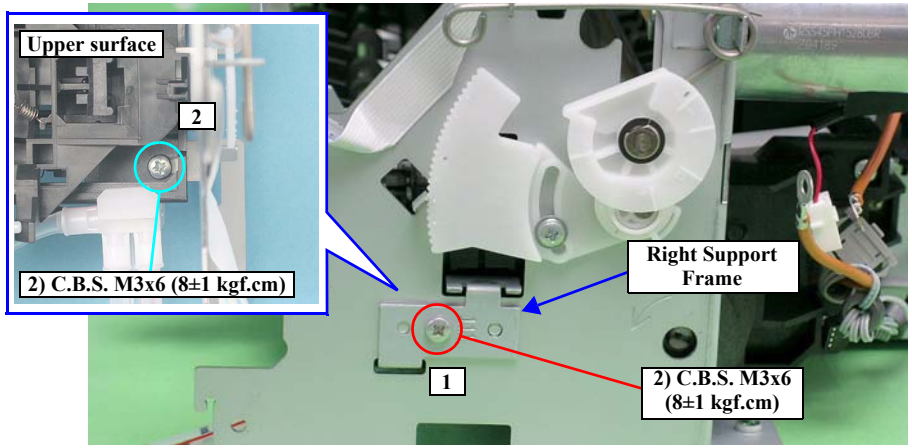


Figure 3-113. Removing the Right Support Frame

REASSEMBLY

- **Align the positioning holes on the Right Support Frame with the guide pins on the Main Frame.**

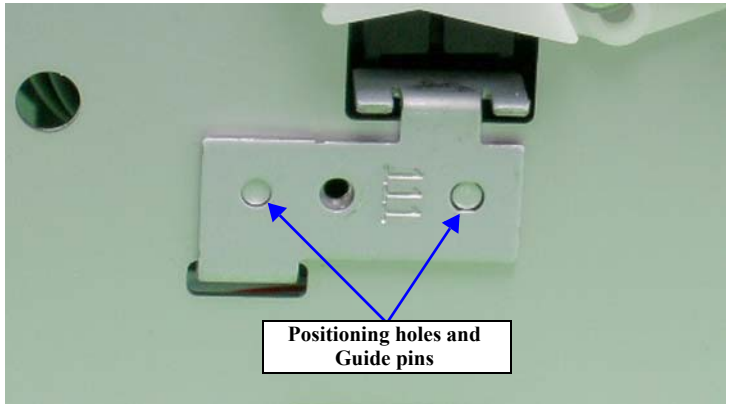


Figure 3-114. Installing the Right Support Frame

- **Tighten the screws in the order shown in Figure 3-113.**

11. Remove the Ink System Unit downwards from the Main Frame.

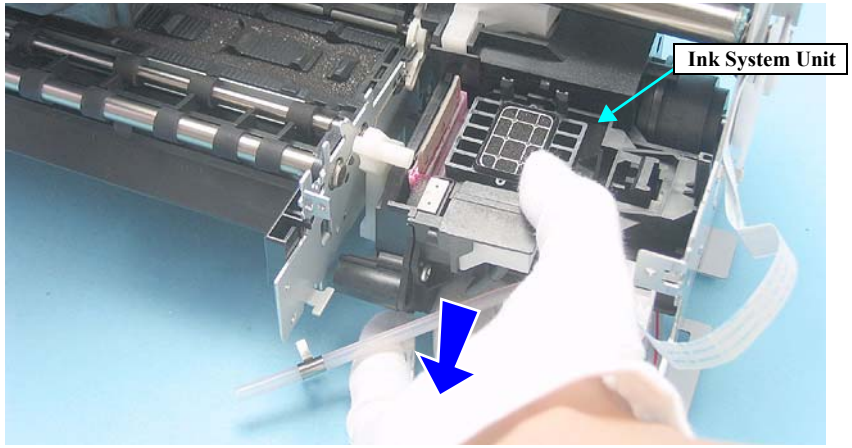
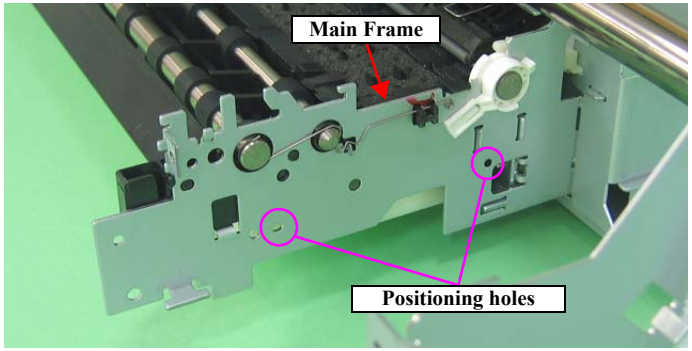


Figure 3-115. Removing the Ink System Unit

REASSEMBLY

Align the positioning two holes on the Main Frame with the two guide pins on the Ink System Unit.



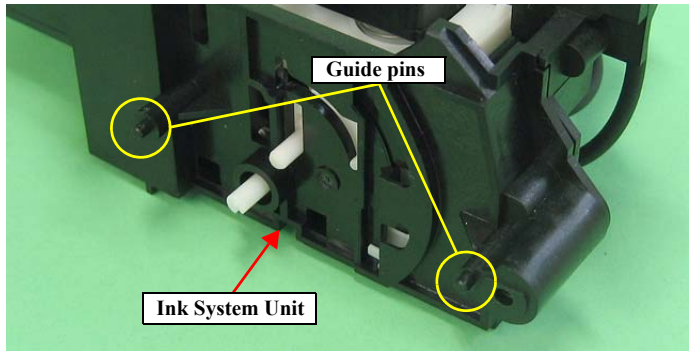


Figure 3-116. Reinstalling the Ink System Unit

3.4.14 Front Paper Guide / Paper EJ Roller

1. *Remove the Paper EJ Frame Assy. (p.80)*
2. *Remove the Lower Housing / Printer Mechanism. (p.61)*
3. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 3.1.6 Locking/Releasing the Carriage (p.41).)*
4. Remove the EJ Grounding Spring from the Main Frame with tweezers.

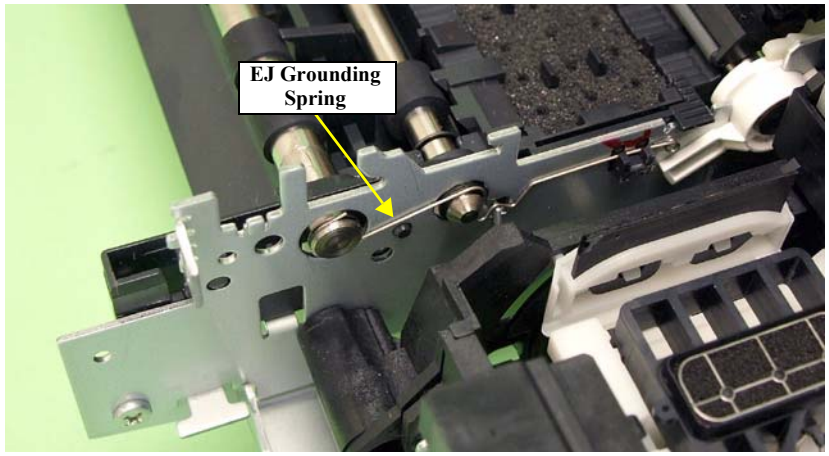


Figure 3-117. Removing the EJ Grounding Spring

REASSEMBLY

Referring to Figure 3-118, correctly install the EJ Grounding Spring.

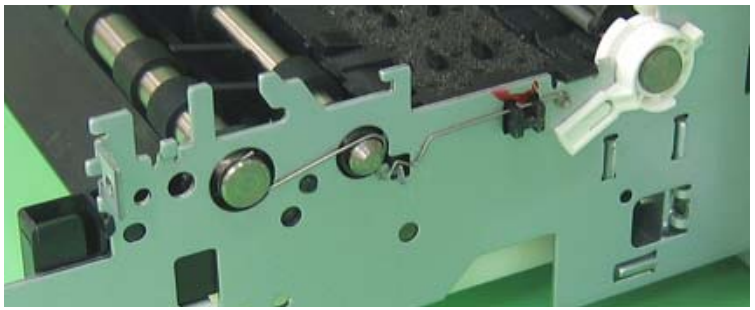


Figure 3-118. Reinstalling the EJ Grounding Spring

5. Remove the Spacer from the EJ Roller Shaft.
6. Remove the guide pins on Left Bushing 8 from the Main Frame using tweezers, and turn Left Bushing 8 toward you to align with the notches on the Main Frame.

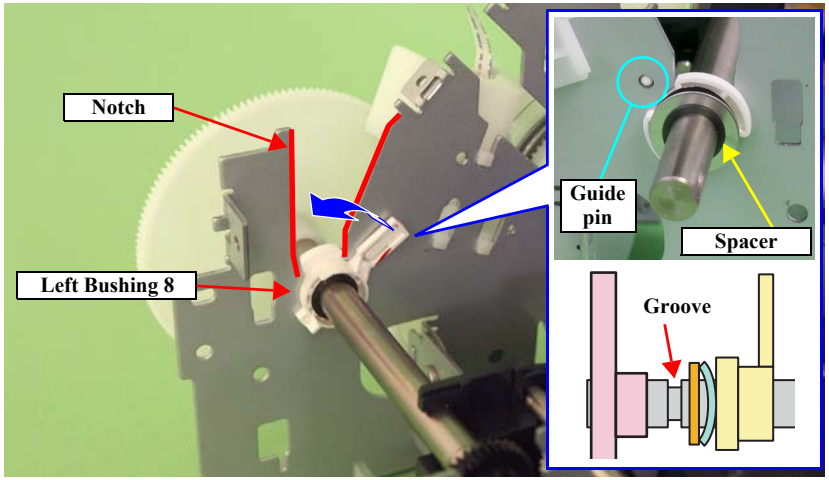


Figure 3-119. Removing the Spacer and Rotating the Left Bushing 8

REASSEMBLY

Insert the spacer into the groove on the Front Paper EJ Roller.

7. Slide the Front Paper EJ Roller to the left, and remove the Left Bushing 8 from the Main Frame.

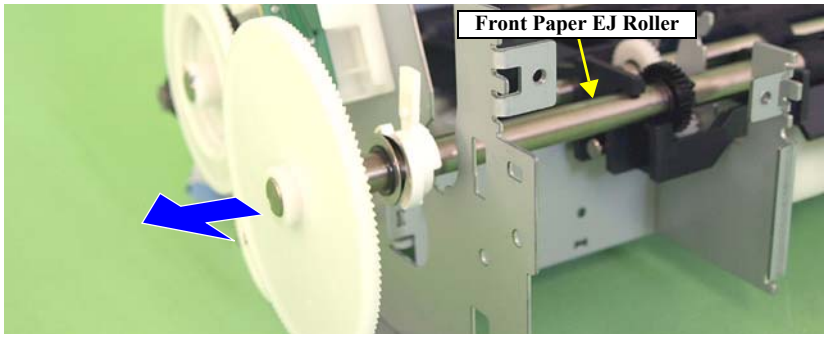


Figure 3-120. Removing the Left Bushing 8

8. Return the Carriage Unit to its home position.
9. Remove the C.B.S. M3 x 6 screw that secure the Left Front Frame.
10. Release the tab that secures the Front Paper Guide from the Main Frame and slide the Front Paper Guide to the left, and turn it until the front side faces up to remove the Front Paper Guide together with the Paper EJ Roller.

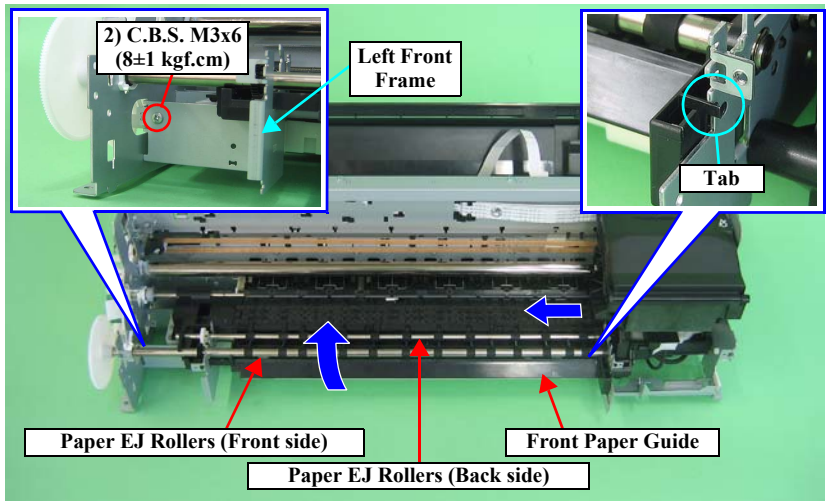


Figure 3-121. Removing the Front Paper Guide/Paper EJ Rollers (1)

11. Pull out the Shaft of the Left Front Frame from the bushing of the Front Paper Guide and remove the Left Front Frame.

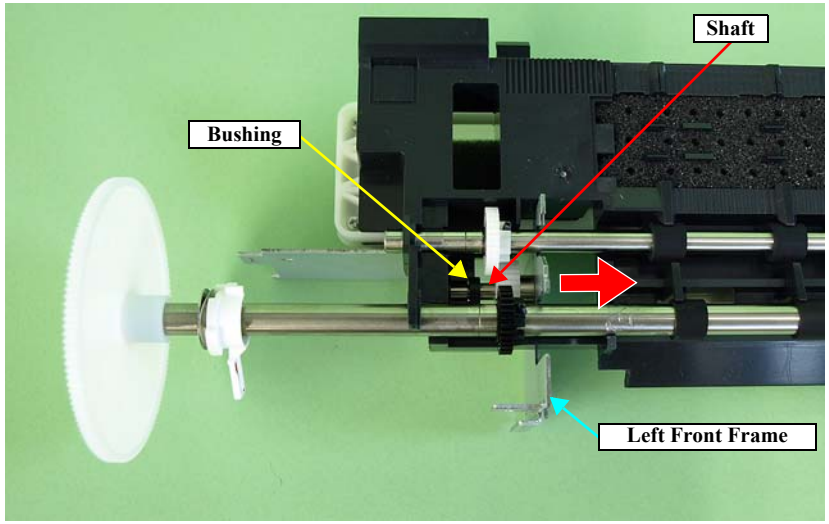


Figure 3-122. Removing the Front Paper Guide/Paper EJ Rollers (2)

REASSEMBLY

■ **Align the bushing of the Front Paper Guide with the PF Roller Shaft.**

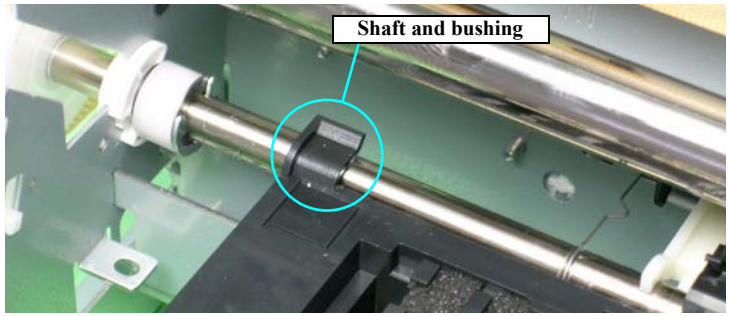


Figure 3-123. The PF Roller Shaft and the bushing of the Front Paper Guide

REASSEMBLY

■ Align the positioning holes on the Main Frame with the guide pins on the Front Paper Guide.

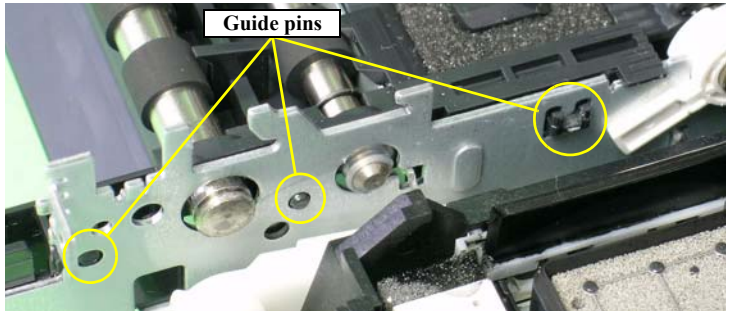


Figure 3-124. Reinstalling the Front Paper Guide

■ After installing the Front Paper Guide, lift the Printer Mechanism to check the following points.

1. Make sure that the tabs on the Paper Guide Pad are not cut midway.
2. Make sure that all the tabs are facing down (toward the Waste Ink Pads) without any folds.
3. Make sure that the tab foldbacks are protruding completely from the Front Paper Guide.

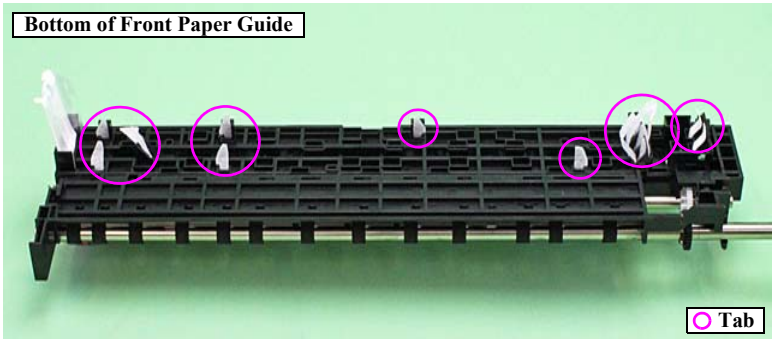


Figure 3-125. Checking the Front Paper Guide Pad

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-45 grease to the area specified for each part.

■ EJ Grounding Spring: See Figure 5-8 on page 138.
■ Front Paper Guide and Paper EJ Roller: See Figure 5-9 on page 138.

ADJUSTMENT REQUIRED

After replacing or removing the Front Paper Guide and Paper EJ Roller, always make the required adjustments referring to the following.

• "Chapter 4 Adjustment *(p.109)*"

3.4.15 PF Roller Shaft

1. *Remove the Front Paper Guide / Paper EJ Roller. (p.85)*
2. *Remove the PF Encoder. (p.97)*
3. *Remove the Upper Paper Guide Assys. (p.91)*
4. Loosen the two C.C. M3 x 4 screws that secure the PF Motor, and remove the PF Drive Belt from the PF Motor Pinion Gear.
5. Remove the spacer that secures Spur Gear 31.5, and remove Spur Gear 31.5 from the Printer Mechanism.

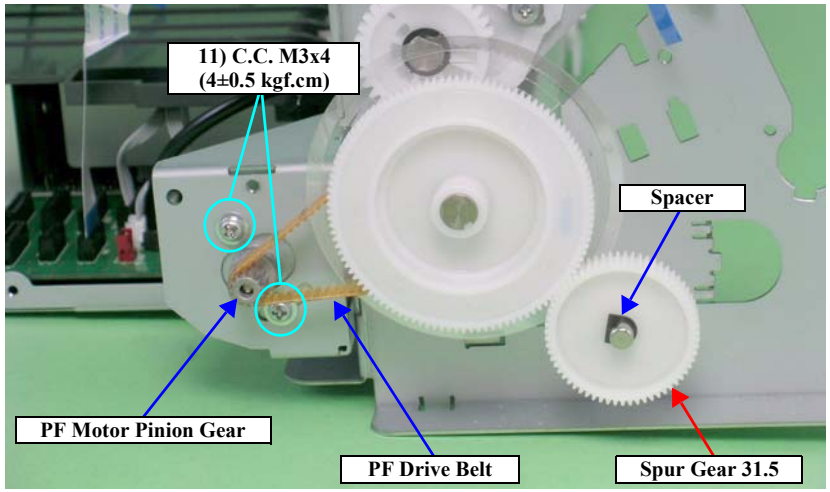


Figure 3-126. Removing the PF Drive Belt and Spur Gear 31.5

6. Remove the PG Grounding Spring from the notch on the Main Frame, and remove the PF Grounding Spring from the groove on the PF Roller Shaft.

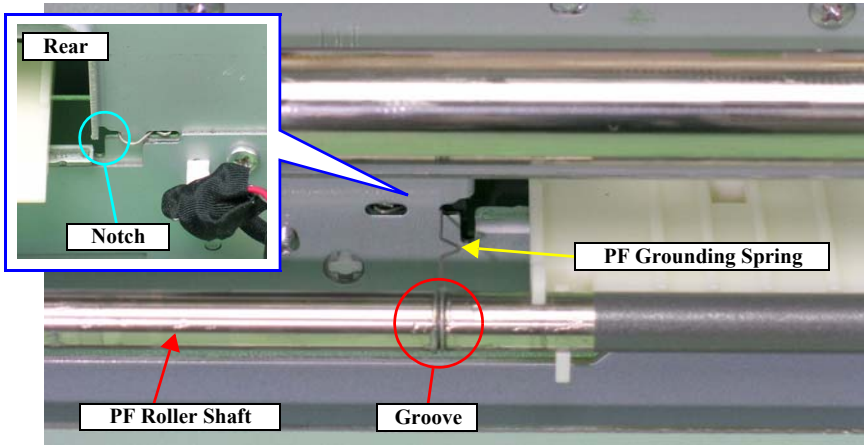


Figure 3-127. Removing the PF Grounding Spring

7. Make sure that the Left Parallelism Adjust Bushing is not protruding from the notch on the Main Frame. If it is protruding, loosen the C.B.S. (P4) M3 x 8 screw that secures the Left Parallelism Adjust Bushing, and slide it to prevent the Left Parallelism Adjust Bushing from becoming hooked on the notch.

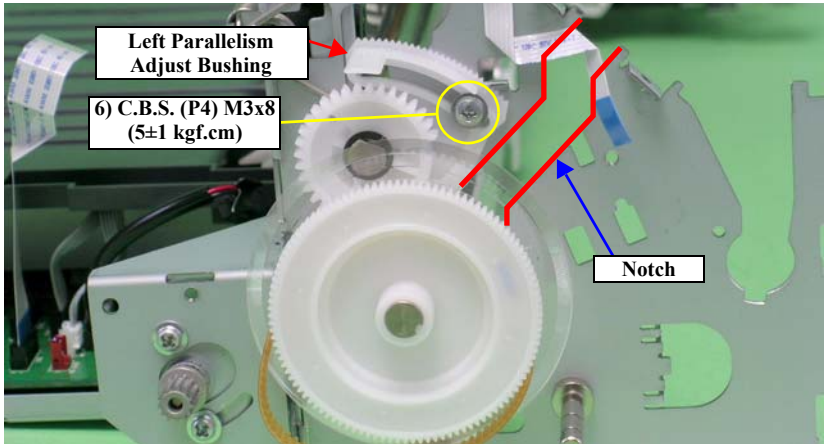


Figure 3-128. Rotating the Left Parallelism Adjust Bushing

8. Remove the guide pin of Left Bushing 8 from the Main Frame using tweezers, and rotate the Bushing upwards to align with the notch on the Main Frame.

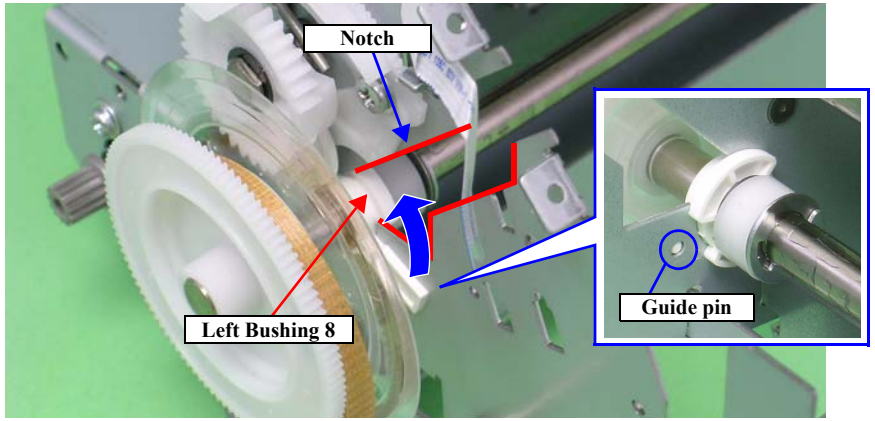


Figure 3-129. Rotating the Left Bushing 8

CAUTION

When performing the following procedure, take care not to lose the E-ring.

9. Remove the E-ring from the PF Roller Shaft with a flathead screwdriver, and slide Left Bushing 8 to the inside of the Printer Mechanism.

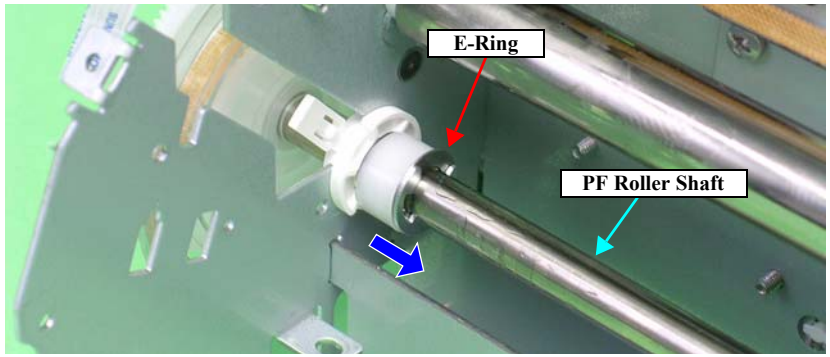


Figure 3-130. Removing the Left Bushing 8

CAUTION

When performing the following procedure, pay attention to the following points.

- **Prevent the coated surface of the PF Roller Shaft from being scratched.**
- **Do not touch the coated surface of the PF Roller Shaft with bare hands.**

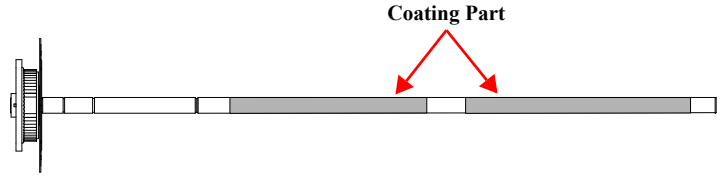


Figure 3-131. Handling the PF Roller Shaft

10. Remove the PF Roller Shaft from the Bushings on the Rear Paper Guide and the Center Support, slide the PF Roller Shaft to the left to remove it from Right Bushing 8, and remove the PF Roller Shaft along the notch of the Main Frame.

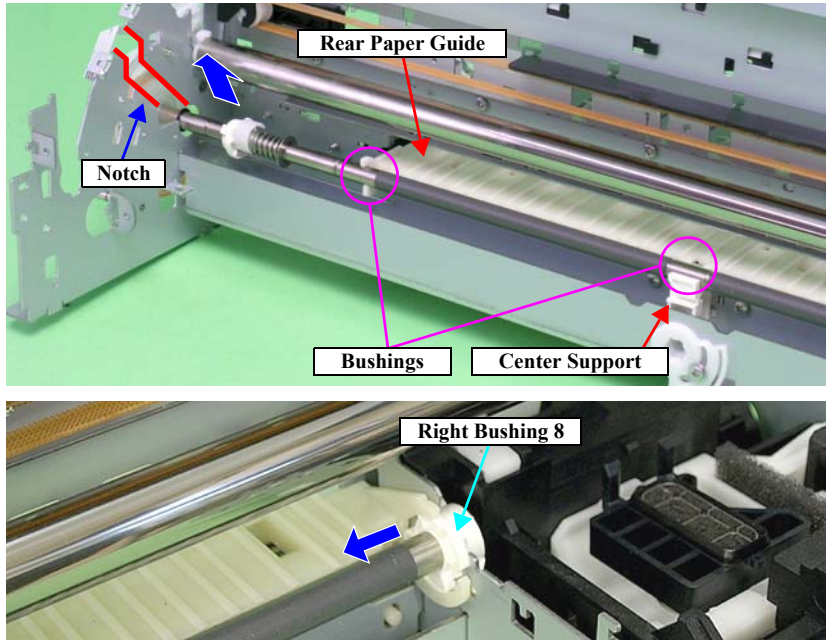


Figure 3-132. Removing the PF Roller Shaft

CAUTION

Be careful not to move Compression Spring 4 and the Leaf Spring on the left side of the PF Roller Shaft to the coated section on the Shaft after removing the PF Roller Shaft.

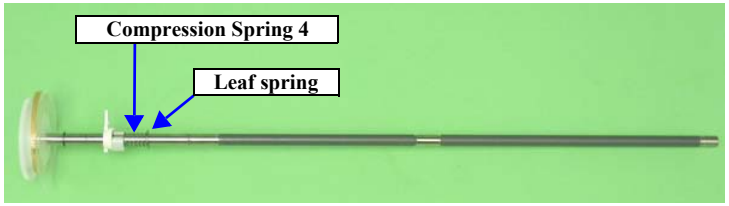


Figure 3-133. Handling the PF Roller Shaft

ADJUSTMENT REQUIRED

After replacing the PF Roller Shaft, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

ADJUSTMENT REQUIRED

After replacing the following parts, be sure to apply G-45 grease to the area specified for each part.

- **PF Roller Shaft: Chapter 5 See Figure 5-10 (p.138) - Figure 5-12 (p.139)**

3.4.16 Release Holder Assy

1. *Remove the Lower Housing / Printer Mechanism. (p.61)*
2. *Remove the ASF Assy. (p.71)*
3. *Remove the APG Assy. (p.55)*
4. Release the PE Sensor connector cable from the five tabs on the Release Holder Assy.
5. Remove the three C.B.S. M3 x 6 screws that secure the Release Holder Assy.
6. Remove the three lower tabs of the Release Holder Assy from the Main Frame with a flathead screwdriver, and remove the Release Holder Assy upwards.

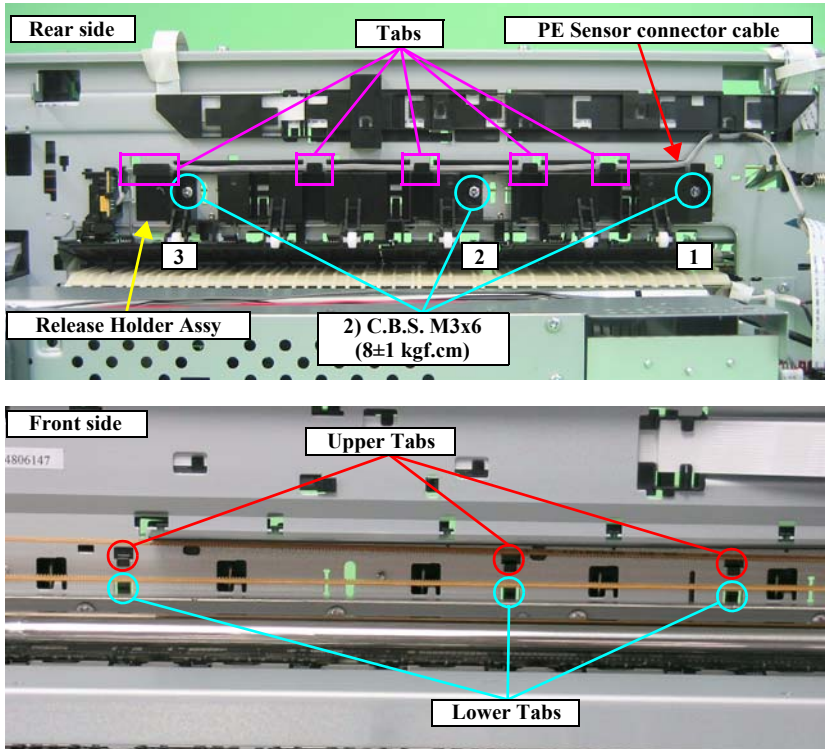


Figure 3-134. Removing the Release Holder Assy

REASSEMBLY

- **Align the three upper tabs on the Release Holder Assy with the positioning holes on the Main Frame. See Figure 3-134 (p.90)**
- **Tighten the screws in the order shown in Figure 3-134**

3.4.17 Upper Paper Guide Assys

1. *Remove the Release Holder Assy. (p.90)*
2. *Remove the PE Sensor Holder. (p.99)*
3. Pass a sheet of A3 size paper into the gap between the Upper Paper Guide Assy and the Rear Paper Guide.

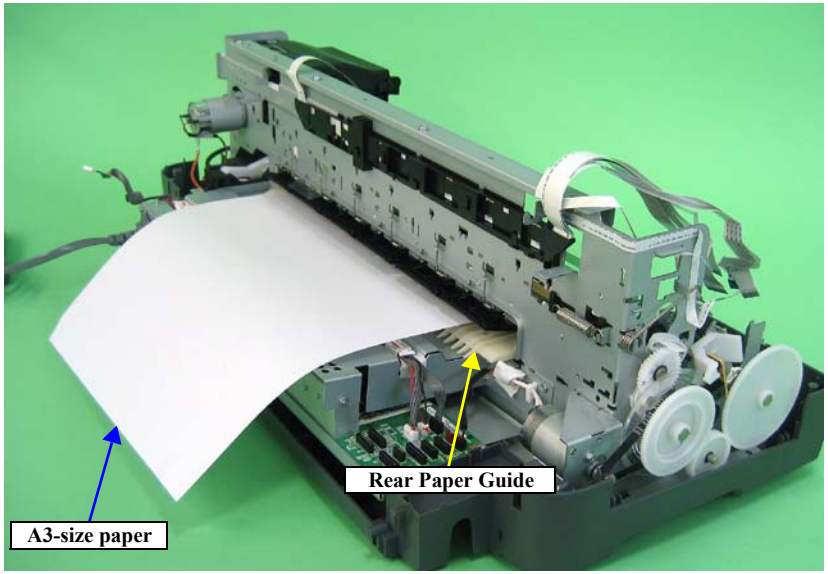


Figure 3-135. Setting the Paper

4. Remove the six Upper Paper Guide Torsion Springs from the tabs on the Main Frame, and pull out the Upper Paper Guide Torsion Springs from the six Upper Paper Guide Assys.

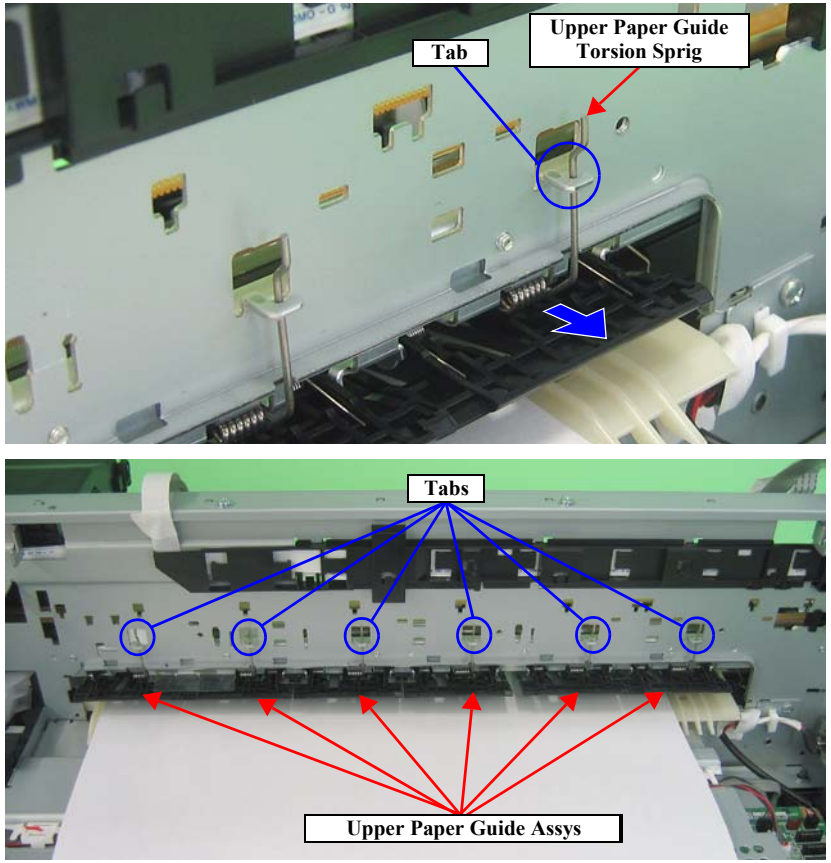


Figure 3-136. Removing the Upper Paper Guide Torsion Spring

REASSEMBLY

Make sure that the leading end of the Upper Paper Guide Torsion Spring can be seen through the hole of the Upper Paper Guide Assy.

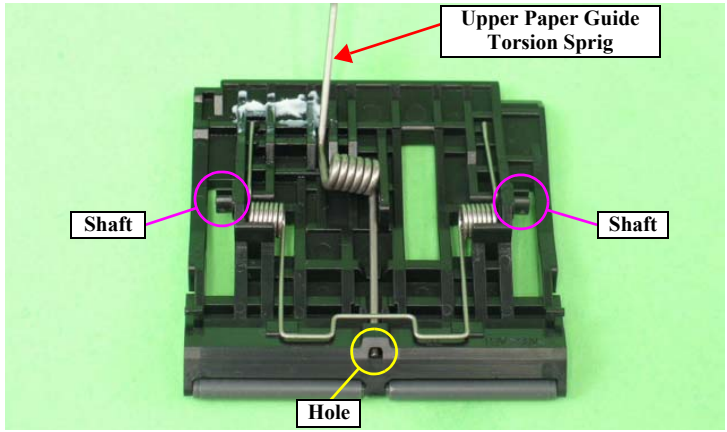


Figure 3-137. Reinstalling the Upper Paper Guide Torsion Spring

5. Lift the six Upper Paper Guide Assys from the Main Frame to release the shaft referring to Figure 3-137, and remove the Upper Paper Guide Assys to the rear.

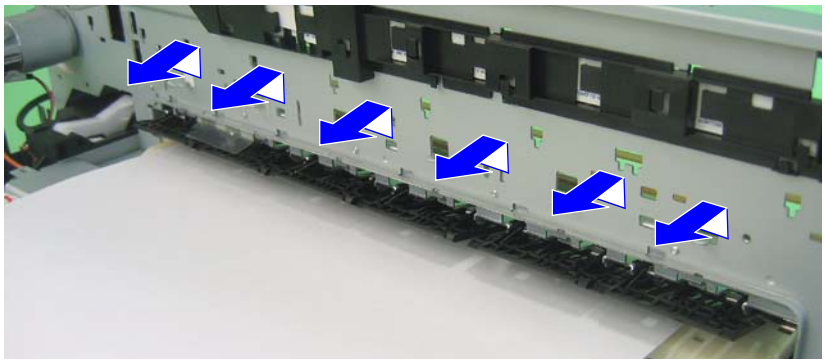


Figure 3-138. Removing the Upper Paper Guide Assy

3.5 Removing the Motors

3.5.1 CR Motor

1. *Remove the ASF Assy. (p.71)*
2. Release the Carriage Lock, and move the Carriage Unit to the center. *(Refer to 3.1.6 Locking/Releasing the Carriage (p.41).)*
3. Remove the two Clamps. *(Refer to 3.4.13 Ink System Unit (p.82).)*
4. Disconnect the CR Motor connector cable from the connector CN115 on the Main Board.
5. Remove the CR Motor connector cable from the Cord Keep.

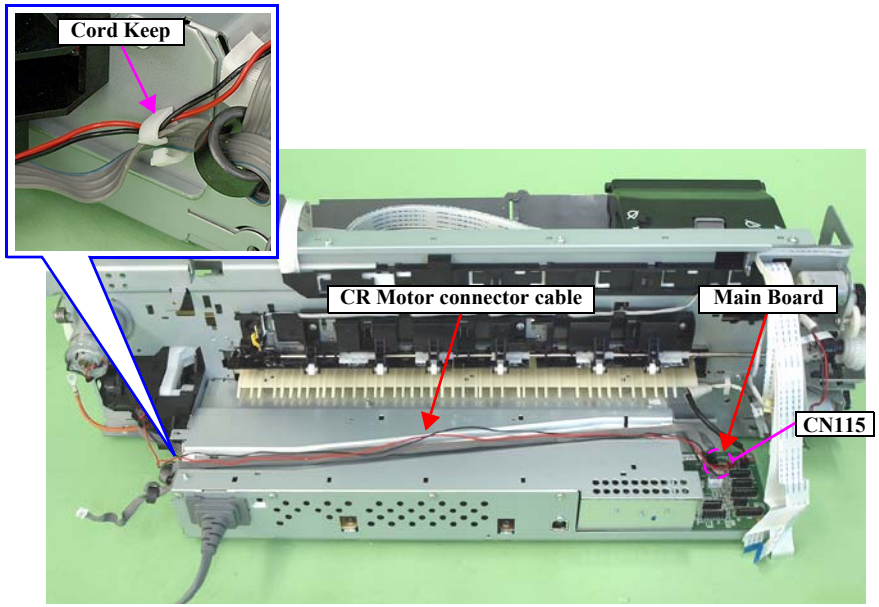


Figure 3-139. Removing the CR Motor connector cable

REASSEMBLY

■ **Attach two pieces of acetate tape (18 mm) on the Upper Shield Plate.**

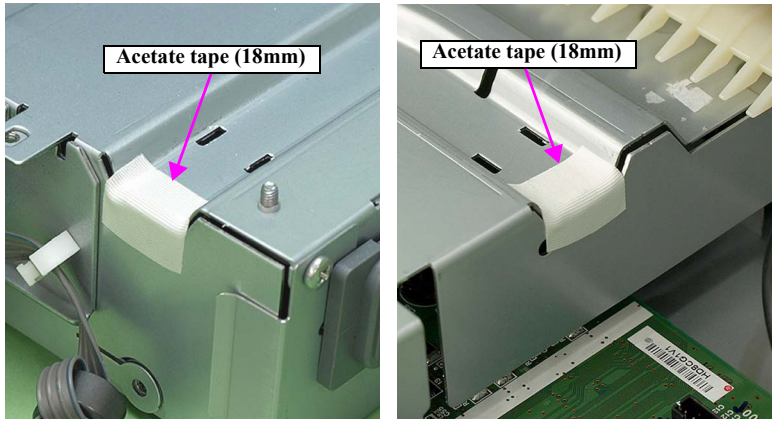


Figure 3-140. Attaching acetate tape

■ **Route the cables as shown below.**

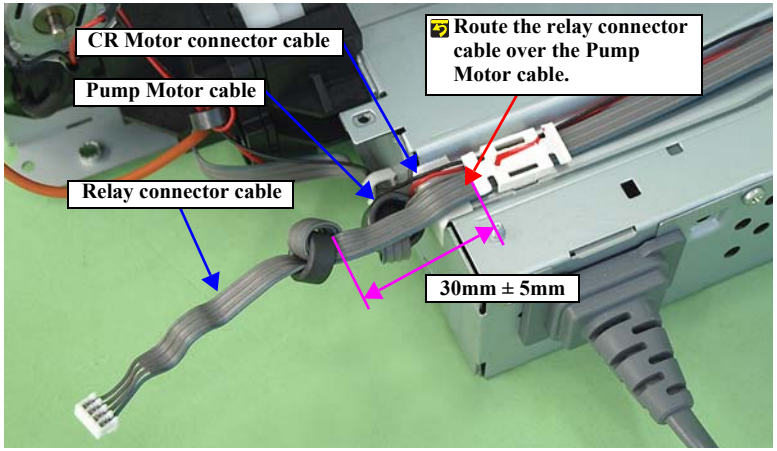


Figure 3-141. Routing the cables

6. .Press the Driven Pulley toward the center to loosen the CR Drive Belt, and remove the CR Drive Belt from the CR Motor Pinion Gear.

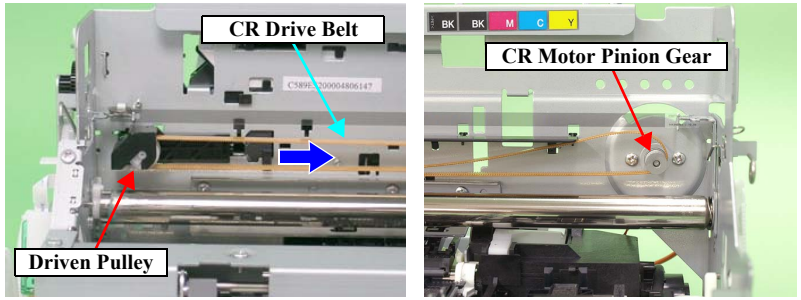


Figure 3-142. Removing the CR Motor

7. Remove the two C.B. M3 x 4 screws that secure the CR Motor, and remove the CR Motor from the Main Frame.

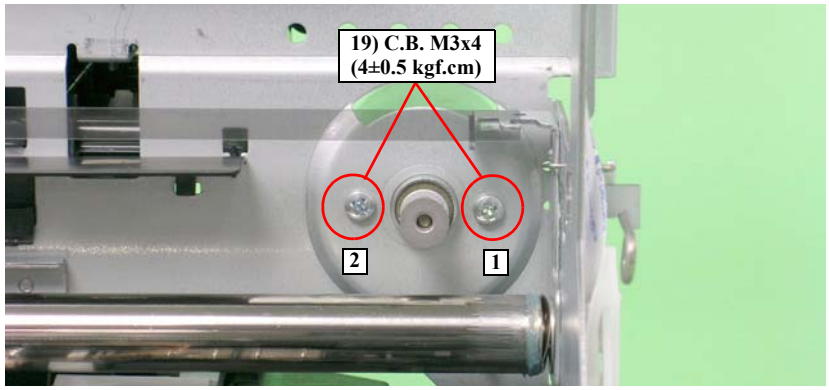


Figure 3-143. Removing the CR Motor

REASSEMBLY

■ **Make the Lot No. printed surface on the CR Motor face the direction shown in the figure below.**

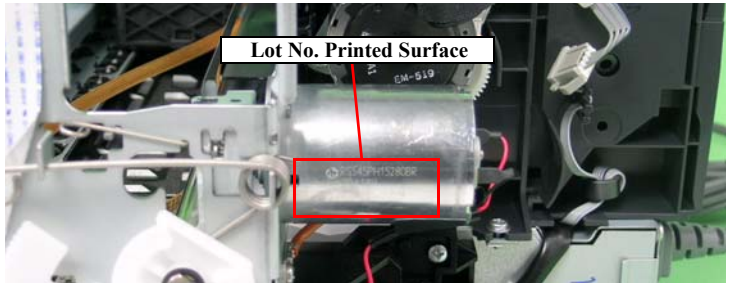


Figure 3-144. Reinstalling the CR Motor

■ **Tighten the screws in the order shown in Figure 3-143**

ADJUSTMENT REQUIRED

After replacing the CR Motor, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

3.5.2 PF Motor

1. Remove the Printer Mechanism. *(Refer to 3.4.4 Lower Housing / Printer Mechanism (p.61).)*
2. Disconnect the PF Motor connector cable from connector CN116 (black) on the Main Board, and remove it from the Clamp on the Main Frame.
3. Remove the two C.C. M3 x 4 screws that secure the PF Motor.
4. Remove the PF Drive Belt from the PF Motor Pinion Gear, and remove the PF Motor from the Printer Mechanism.

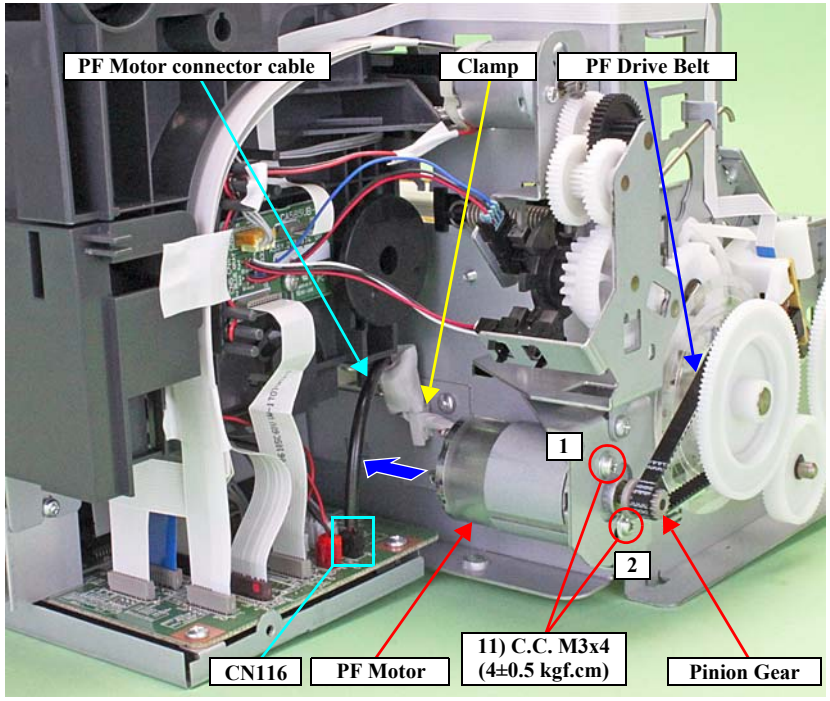


Figure 3-145. Removing the PF Motor

ADJUSTMENT REQUIRED

■ **Make the slit on the PF Motor face the direction shown in the figure below.**

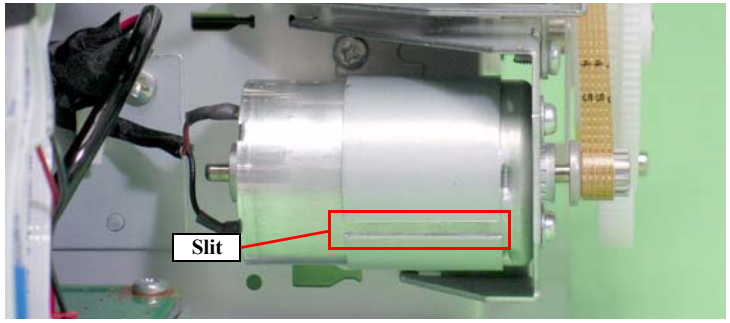


Figure 3-146. Reinstalling the PF Motor

■ **Tighten the screws in the order shown in Figure 3-145**

ADJUSTMENT REQUIRED

After replacing or removing the PF Motor, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

3.5.3 ASF Motor

1. *Remove the Upper Housing / Printer Cover. (p.50)*
2. Remove the Earth cable. (refer to 3.4.6 ASF Assy Step2 (p71) .)
3. Release the ASF Motor cable from the cable hook and disconnect the relay connector.
4. Remove the two C.B.P. M3 x 8 screws that secure the ASF Motor and remove the ASF Motor.

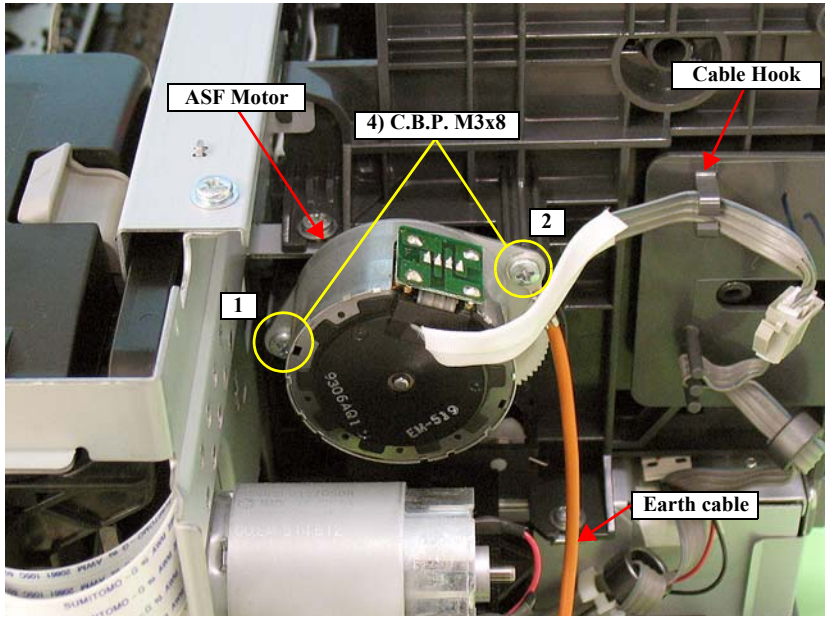


Figure 3-147. Removing the ASF Motor

REASSEMBLY

- **Secure the grounding wire and the ASF Motor together with the screw in the middle of the printer.**
- **Tighten the screws in the order shown in Figure 3-147**

REASSEMBLY

- **Attach a piece of acetate tape (60 mm) on the ASF Motor Cable as shown below.**

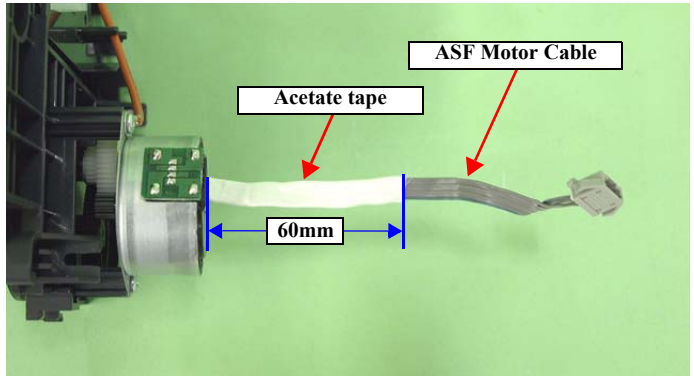


Figure 3-148. Attaching acetate tape

3.6 Removing the Sensors

3.6.1 CR Encoder

1. *Remove the Carriage Shaft / Carriage Unit. (p.63)*
2. Remove the two C.B.P. M2.6 x 5 screws that secure the CR Encoder Sensor Board.
3. Disconnect the PW Sensor FFC from the connector on the CR Encoder Sensor Board, and remove the CR Encoder Sensor Board.

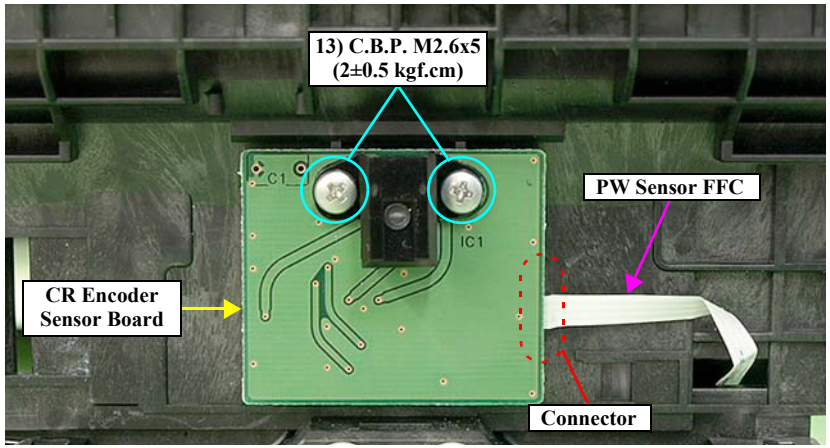


Figure 3-149. Removing the CR Encoder Sensor Board

3.6.2 PF Encoder

1. *Remove the Upper Housing / Printer Cover. (p.50)*
2. Disconnect the FFC from the PF Encoder Sensor Board.
3. Remove the C.B.S. M3 x 8 screw that secures the PF Encoder Sensor Holder.

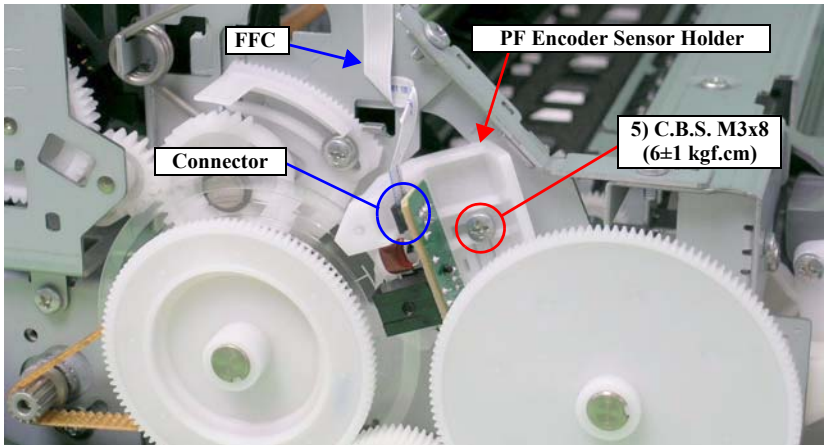


Figure 3-150. Removing the FFC and the Screw that Secures the PF Encoder Sensor Holder

4. While pressing the guide pin on the PF Encoder Sensor Holder using tweezers, slide the holder upwards to release the three tabs, and remove the PF Encoder Sensor Holder.

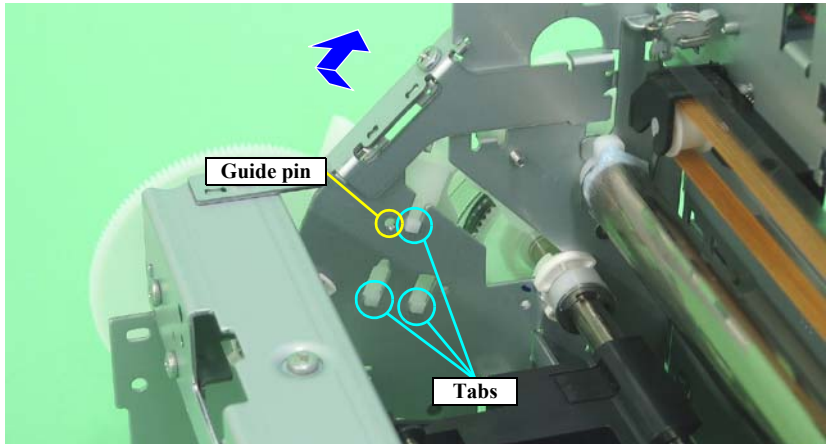


Figure 3-151. Removing the PF Encoder Sensor Holder

REASSEMBLY

- **Make sure that the PF Scale is in the slit on the PF Encoder Sensor.**
- **Make sure that the PF Encoder Sensor is not in contact with the PF Scale.**

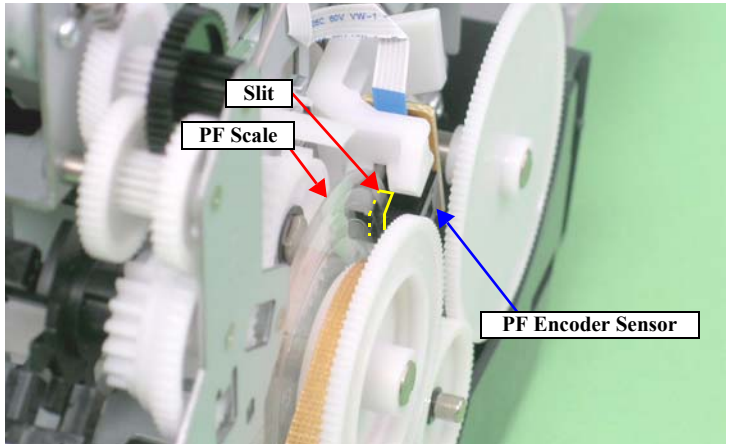


Figure 3-152. Reinstalling the PF Encoder Sensor Holder

3.6.3 PW Sensor

1. *Remove the Carriage Shaft / Carriage Unit. (p.63)*
2. Remove the C.P.B. (P1) M1.7 x 5 screw that secures the PW Sensor Holder, and remove the PW Sensor Holder from the Carriage Unit.

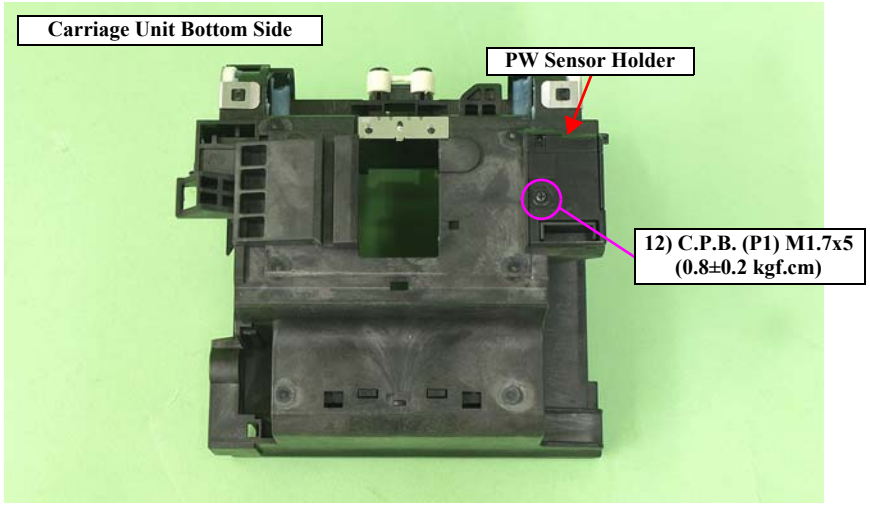


Figure 3-153. Removing the PW Sensor Holder

3. Disconnect the PW Sensor FFC from the PW Sensor connector, and remove the PW Sensor.

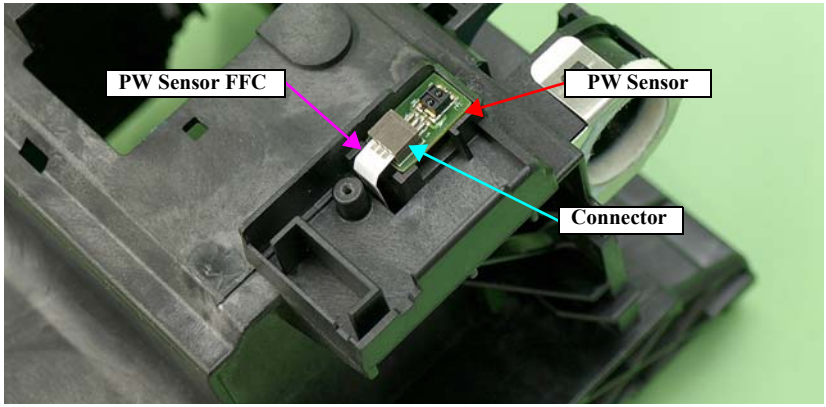


Figure 3-154. Removing the PW Sensor

REASSEMBLY

Make sure that the PW Sensor FFC is routed as shown in Figure 3-154

ADJUSTMENT REQUIRED

After replacing or removing the PW Sensor, always make the required adjustments referring to the following.

- **"Chapter 4 Adjustment *(p.109)*"**

3.6.4 PE Sensor Holder

1. *Remove the Lower Housing / Printer Mechanism. (p.61)*
2. *Remove the ASF Assy. (p.71)*
3. Remove the PE Sensor connector cable from the five tabs on the Release Holder Assy and the two tabs on the Head Cable Cover.

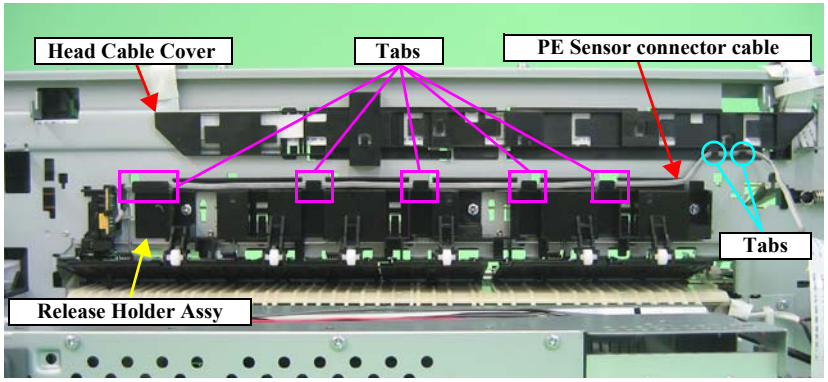


Figure 3-155. Releasing the Cables

4. Release the tabs that secure the PE Sensor Holder from the notch on the Main Frame with a flathead screwdriver, and slide the PE Sensor Holder upwards and then remove it toward you.

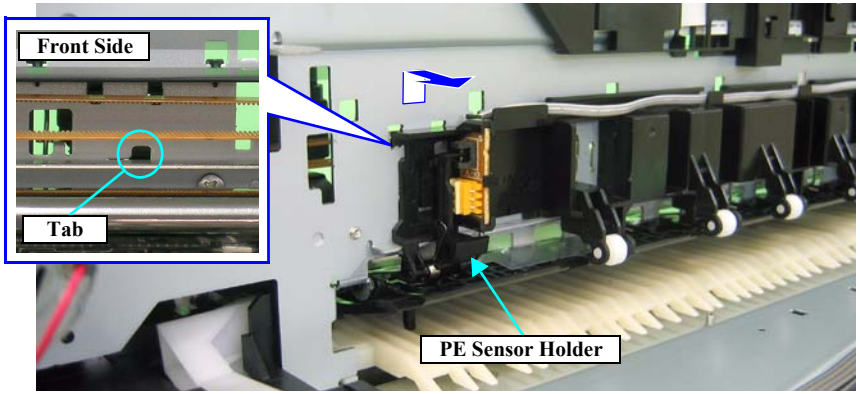


Figure 3-156. Removing the PE Sensor Holder

REASSEMBLY

Align the four tabs and guide pin on the PE Sensor Holder with the positioning holes on the Main Frame correctly so that there is no gap between the PE Sensor Holder and the Main Frame.

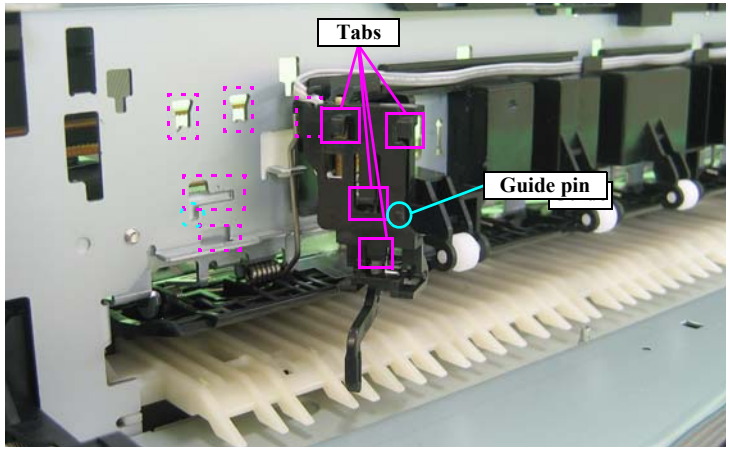
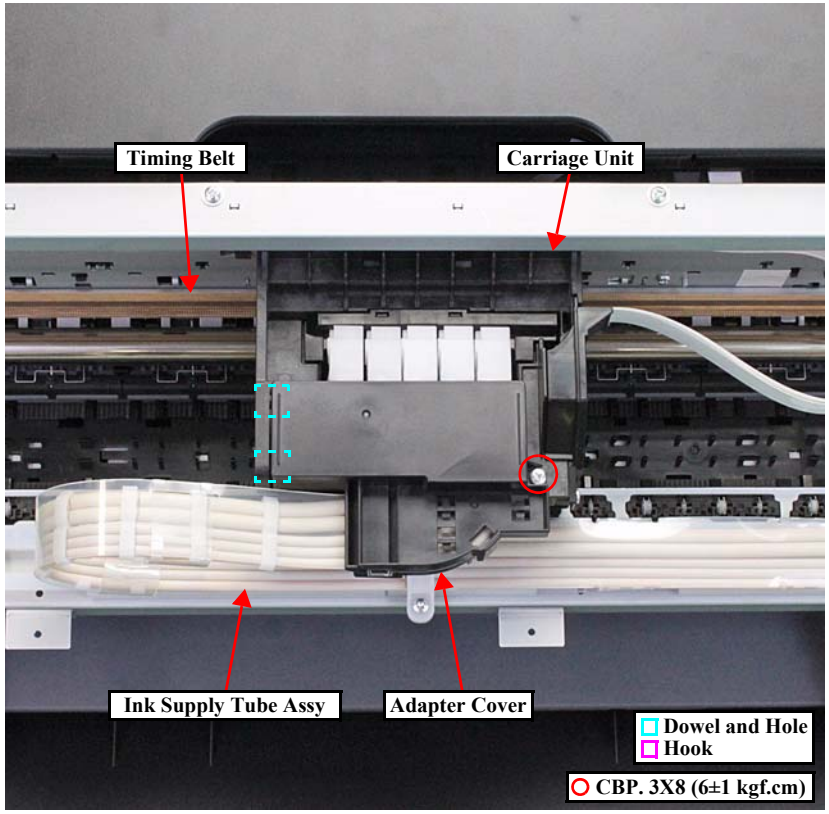


Figure 3-157. Reinstalling the PE Sensor

3.7 Disassembling the CISS section

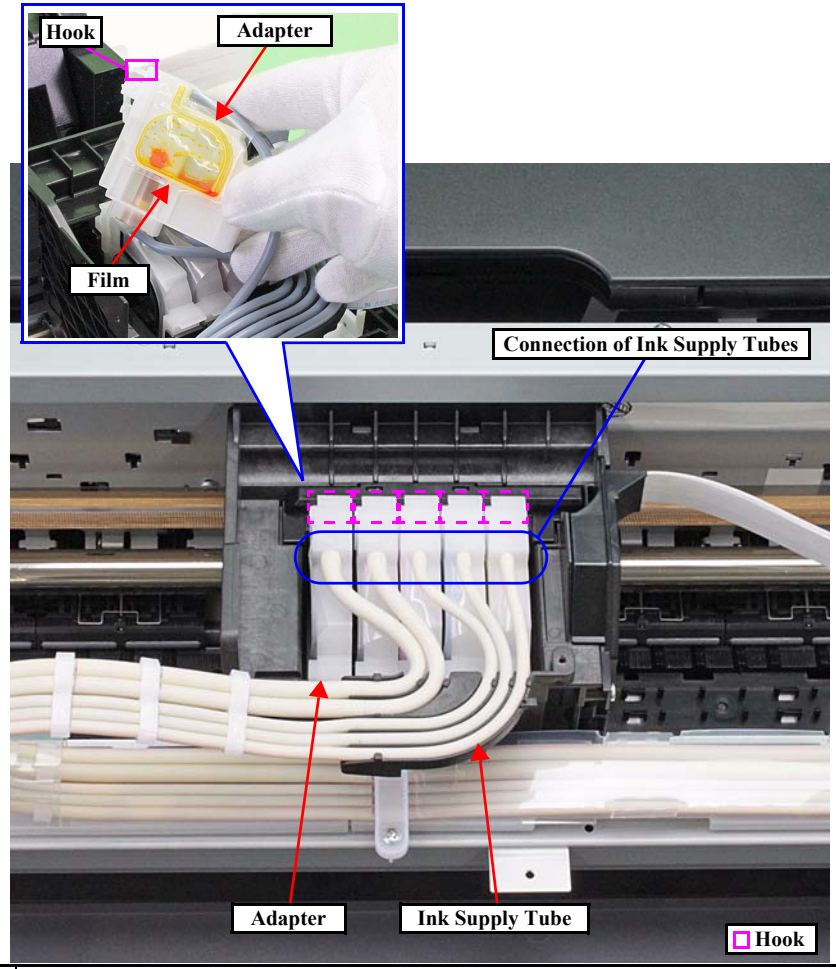
3.7.1 Adapter section

3.7.1.1 Adapter Cover



	■ When attaching the Adapter Cover, align the dowels (x2) with the holes (x2) on the Carriage Unit, then engage the hook. ■ Take care not to catch the Ink Supply Tube Assy. ■ After installing the Adapter Cover to the Carriage Unit, move the Carriage Unit from side to side while holding the Timing Belt to make sure that the Ink Supply Tube Assy does not apply extra load of the Carriage Unit movement.

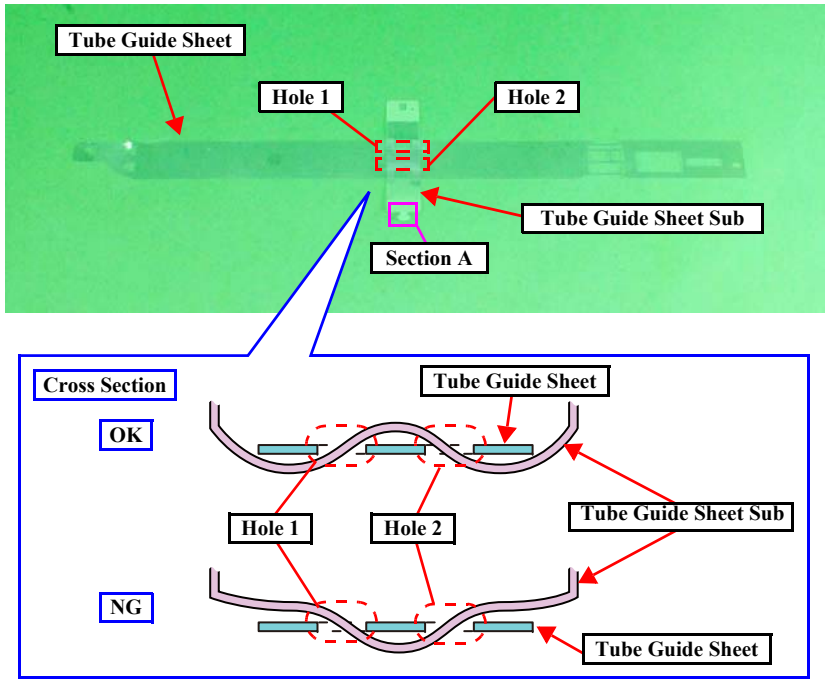
3.7.1.2 Adapter



	Be careful not to damage or peel off the film of the Adapter.
	Use a precision screwdriver when releasing the hooks of the Adapter.
	When connecting the Ink Supply Tube to the Adapter, take care not to connect it to a wrong joint.

3.7.2 Ink Supply Tube Assy section

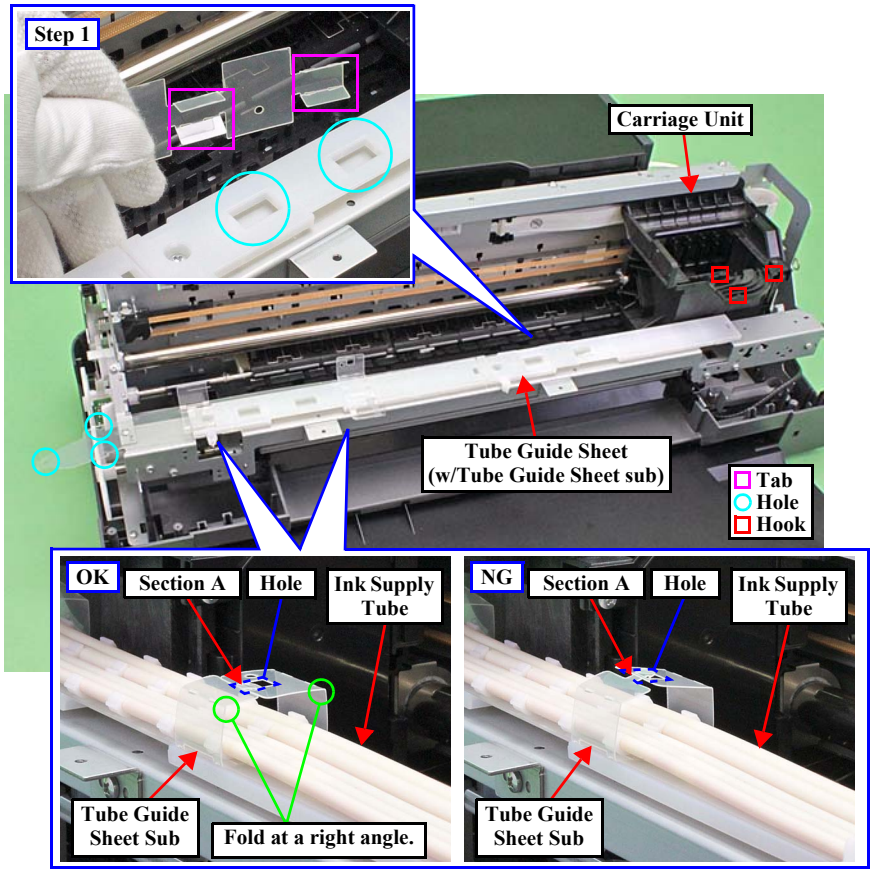
3.7.2.1 Tube Guide Sheet/Tube Guide Sheet Sub



Refer the figure above and follow the procedure below when attaching the Tube Guide Sheet Sub to the Tube Guide Sheet.

1. Insert the section A of the Tube Guide Sheet Sub into the hole 1 of the Tube Guide Sheet from the bottom.
2. Insert the section A of the Tube Guide Sheet Sub into the hole 2 of the Tube Guide Sheet from the top.

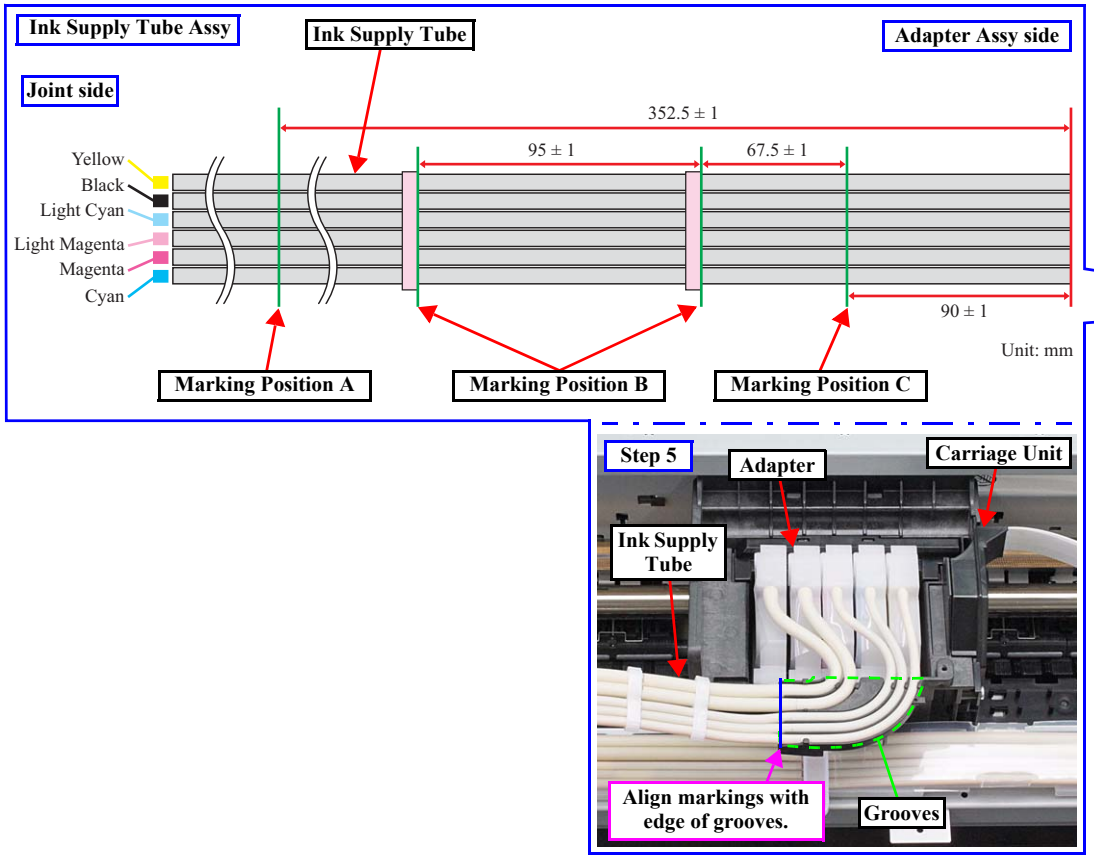
3.7.2.2 Tube Guide Sheet (w/Tube Guide Sheet sub)

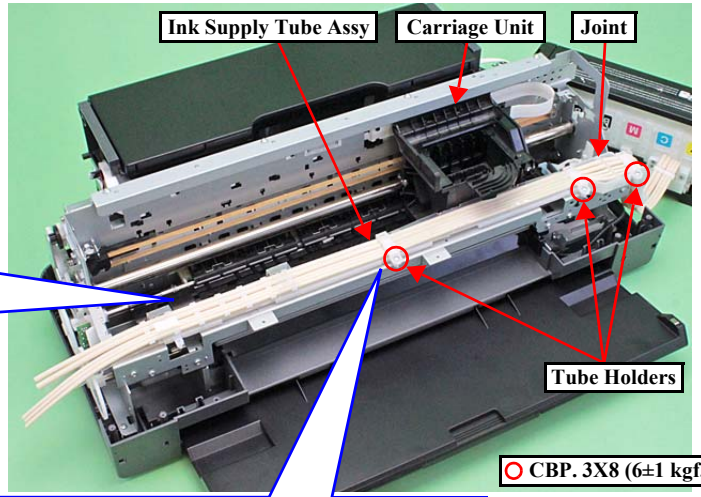


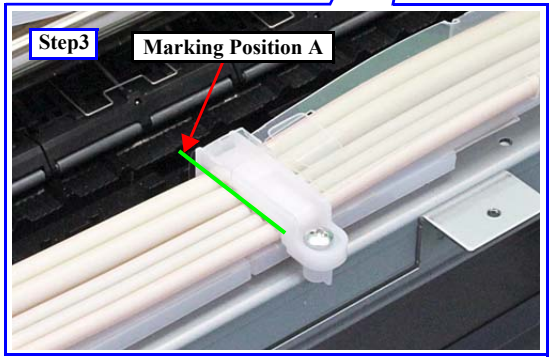
Follow the procedure below when installing the Tube Guide Sheet (w/Tube Guide Sheet sub).

1. Insert the tabs (x2) on the Tube Guide Sheet (w/Tube Guide Sheet sub) in the holes (x2) on the Ink Supply Tube Guide 2nd, then attach the Tube Guide Sheet (w/Tube Guide Sheet sub) to the printer.
2. Install the Ink Supply Tube Assy. (p.103)
3. Insert the section A of the Tube Guide Sheet Sub (x2) into the hole of the Tube Guide Sheet Sub from the top to secure it.
4. Engage the holes (x3) on the Tube Guide Sheet (w/Tube Guide Sheet sub) with the hooks (x3) on the Carriage Unit, and attach the Tube Guide Sheet (w/Tube Guide Sheet sub) on the Carriage Unit.

3.7.2.3 Ink Supply Tube Assy







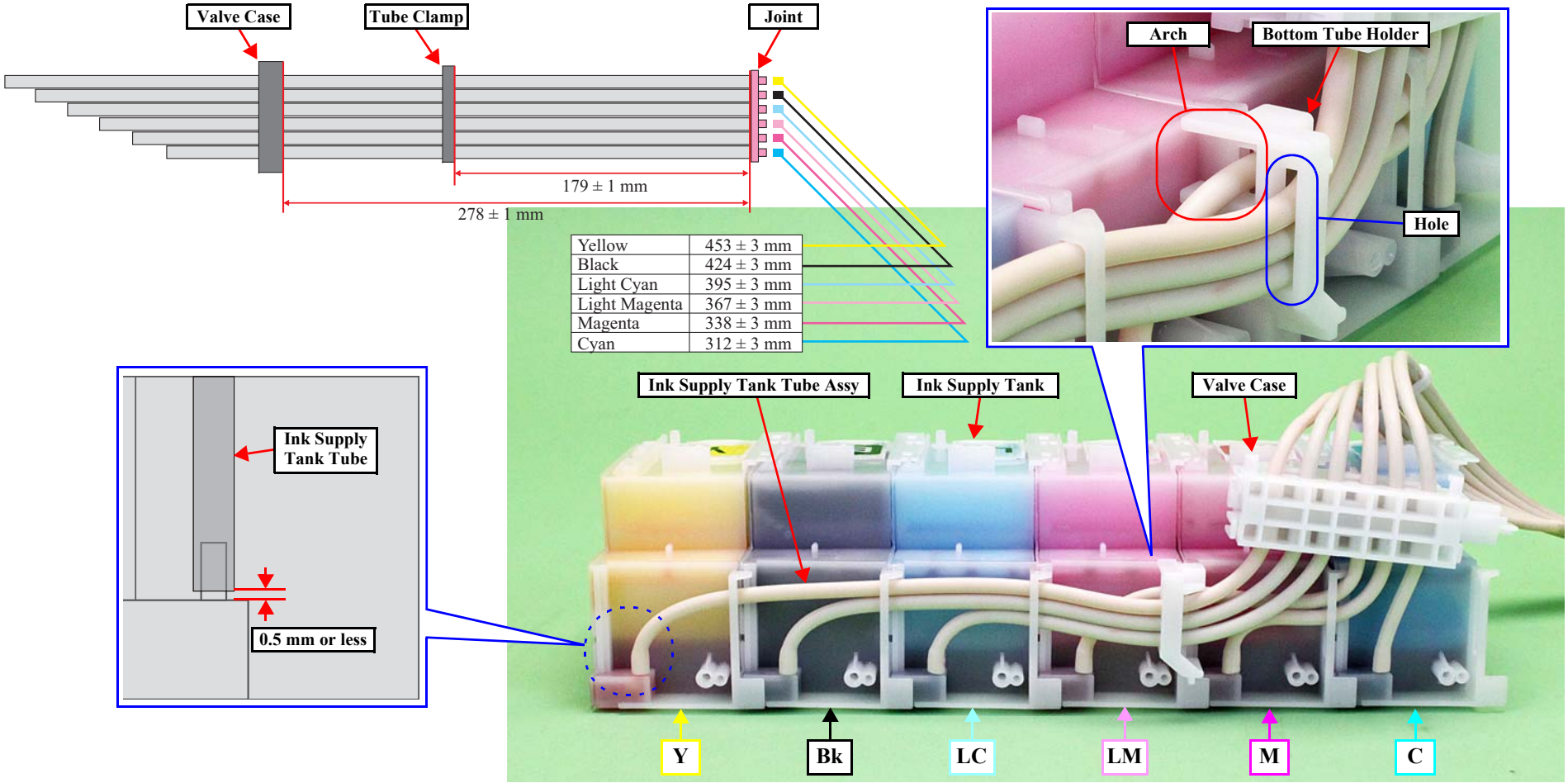
- Make sure the Tube Clamp (x2) are aligned with the Marking Position B shown above and attached on the Ink Supply Tube Assy.
- When installing the Tube Holder, take care not to catch the Ink Supply Tube Assy.

Follow the procedure below when installing the Ink Supply Tube Assy.

1. Attach the Tube Guide Sheet (w/Tube Guide Sheet sub) on the printer. (p.103)
2. Connect the Ink Supply Tubes (x6) to the Joint. (p.105)
3. Attach the Tube Holder (x3) and secure them with the screws (x1 each). When attaching the one nearest to the 130 digit side, align it with the Marking Position A on the Ink Supply Tube Assy.
4. Connect the Ink Supply Tube to the Adapter, and install the Adapter to the Carriage Unit. (p.101)
5. Route the Ink Supply Tubes through the grooves on the Carriage Unit, and align the Marking Position C on the Ink Supply Tubes with the edge of the grooves as shown in the figure above.

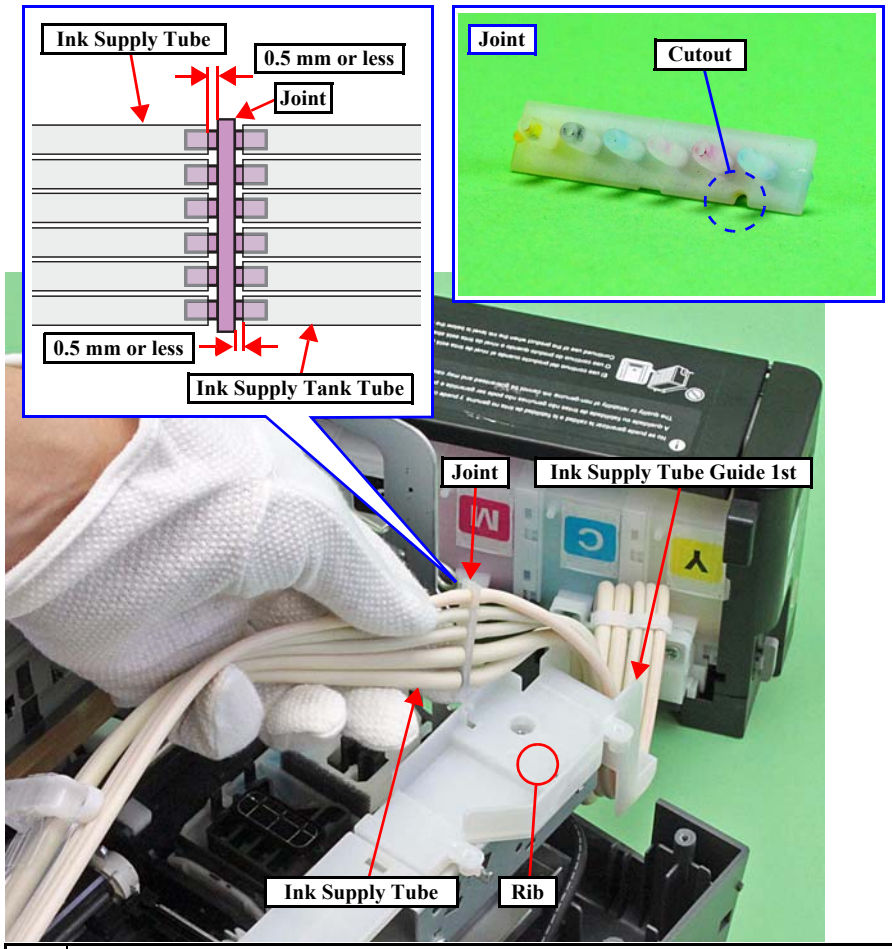
3.7.3 Ink Supply Tank Tube Assy section

3.7.3.1 Ink Supply Tank Tube Assy



- Route the Ink Supply Tank Tubes with the red lines facing upward (as viewed when the Ink Supply Tank Assy is installed on the printer) and connect them to the Ink Supply Tank Assy without any twist.
- When connecting the Ink Supply Tank Tubes to the Ink Supply Tank, confirm the color indicated on the film of the Ink Supply Tank, and take care not to connect them with wrong joints.
- When connecting the Ink Supply Tank Tubes to the Ink Supply Tank, insert the tubes to the full and make sure the gaps between the end of tubes and the tank are 0.5 mm long or less.
- Route the tube through the arch on the Bottom Tube Holder. Take care not to catch the Ink Supply Tank Tube then.
- Route Yellow, Black, and Light Cyan of the Ink Supply Tank Tube Assy through the hole on the Bottom Tube Holder.

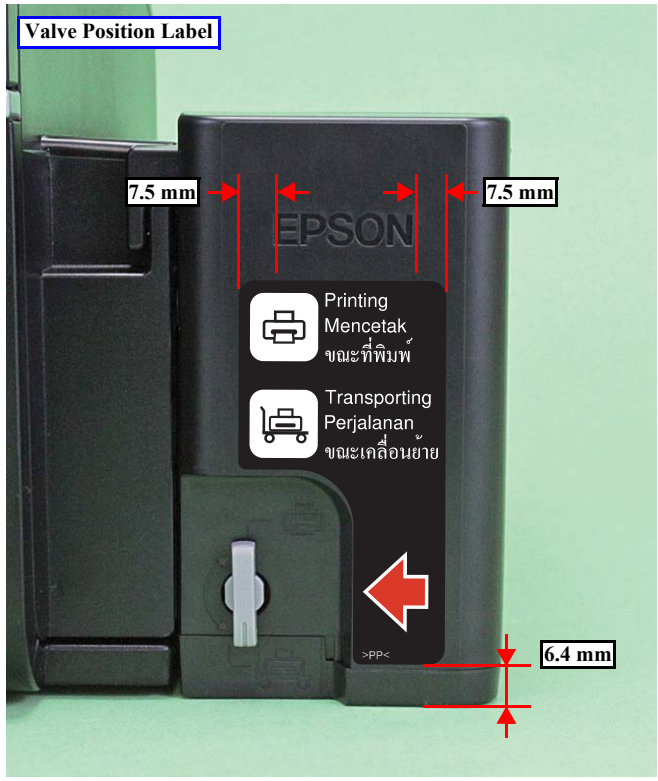
3.7.3.2 Joint



- Make sure the red lines of the Ink Supply Tank Tube and Ink Supply Tube facing upward.
- When attaching the Joint, align the cutout of the Joint with the rib of the Ink Supply Tube Guide 1st.
- Make sure the gaps between the end of Ink Supply Tank Tubes or Ink Supply Tubes and the Joint are 0.5 mm long or less.
- When connecting the Ink Supply Tank Tube to the Joint, take care noto to connect it to a wrong joint.

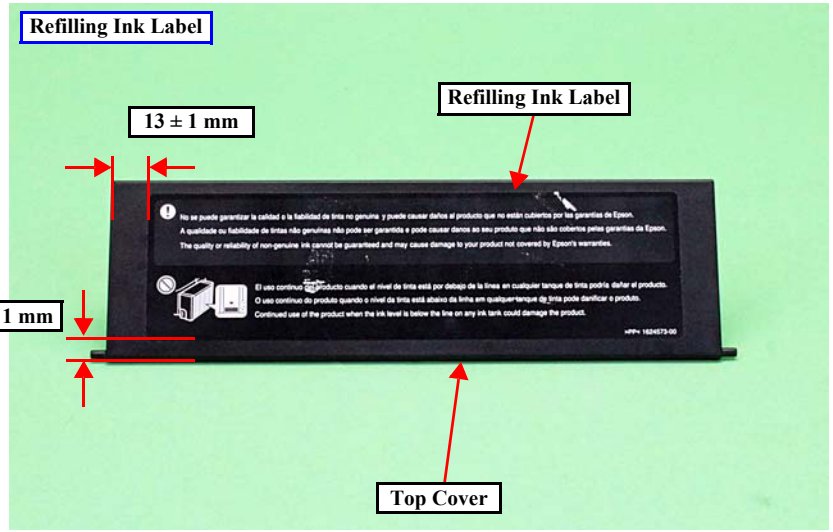
3.7.4 Ink Supply Tank Assy section

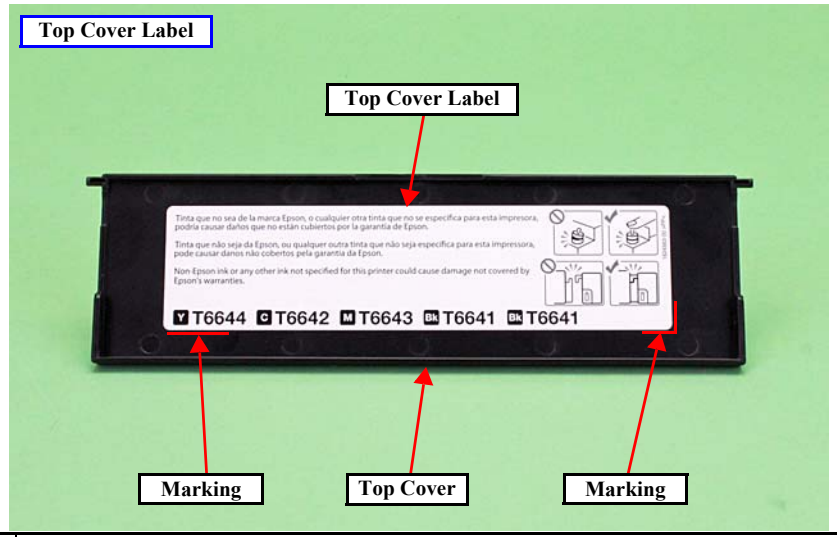
3.7.4.1 Valve Position Label



Attach the Refilling Ink Label and Valve Position Label according to the standards shown in the figure above.

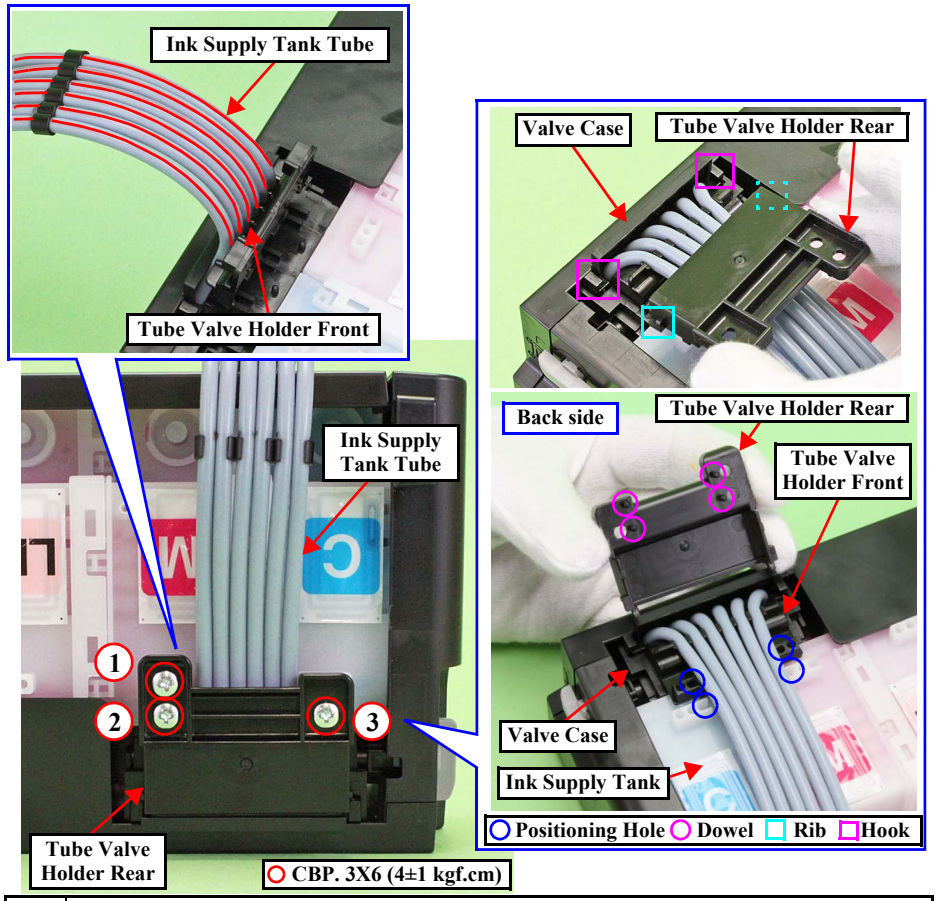
3.7.4.2 Top Cover





- Attach the Refilling Ink Label on the position shown in the figure above.
- When attaching the Top Cover Label, align it with the markings on the Top Cover as shown in the figure above.

3.7.4.3 Tube Valve Holder Front/Rear

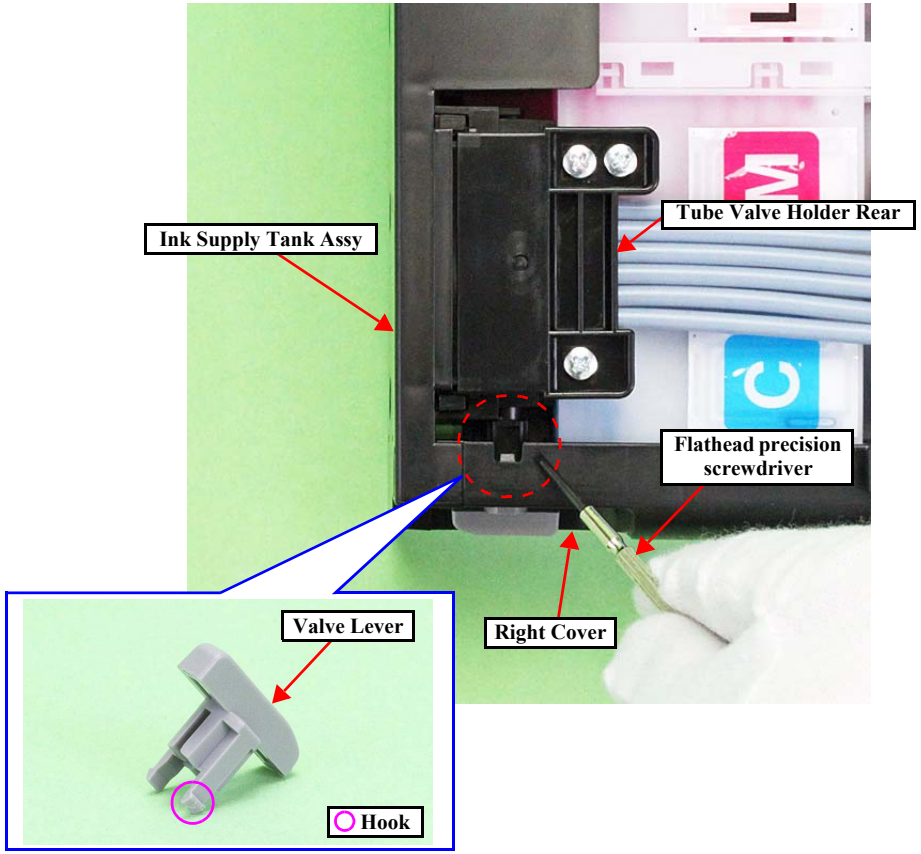


- When routing the Ink Supply Tank Tubes, align them with their red lines facing the Tube Valve Holder Front without any twist.

Follow the procedure below when installing the Tube Valve Holder Rear.

1. Insert the ribs (x2) of the Tube Valve Holder Rear under the hooks (x2) of the Valve Case.
2. Align the dowels (x4) of the Tube Valve Holder Rear with the positioning holes (x2) of the Ink Supply Tank and the positioning holes (x2) of the Tube Valve Holder Front.
3. Make sure no Ink Supply Tank Tubes are caught, then secure it with the screws (x3) in the order shown in the above figure.

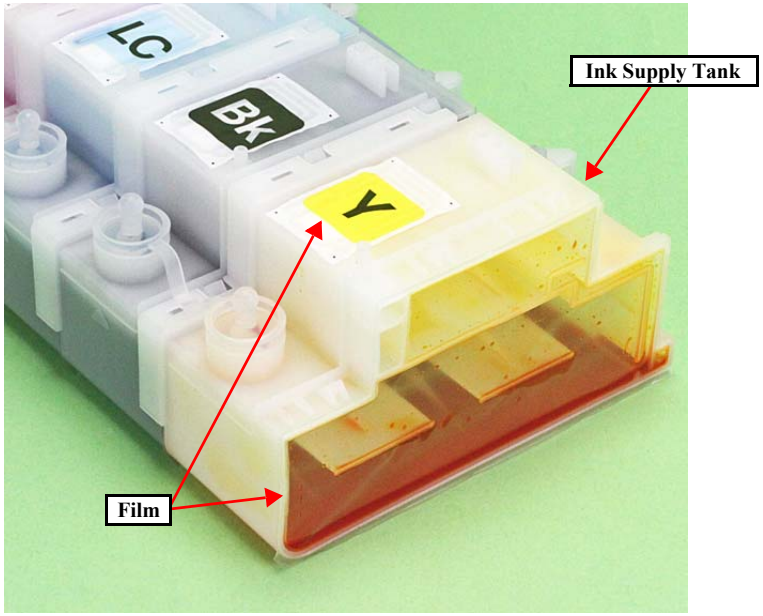
3.7.4.4 Valve Lever



Follow the procedure below when removing the Valve Lever.

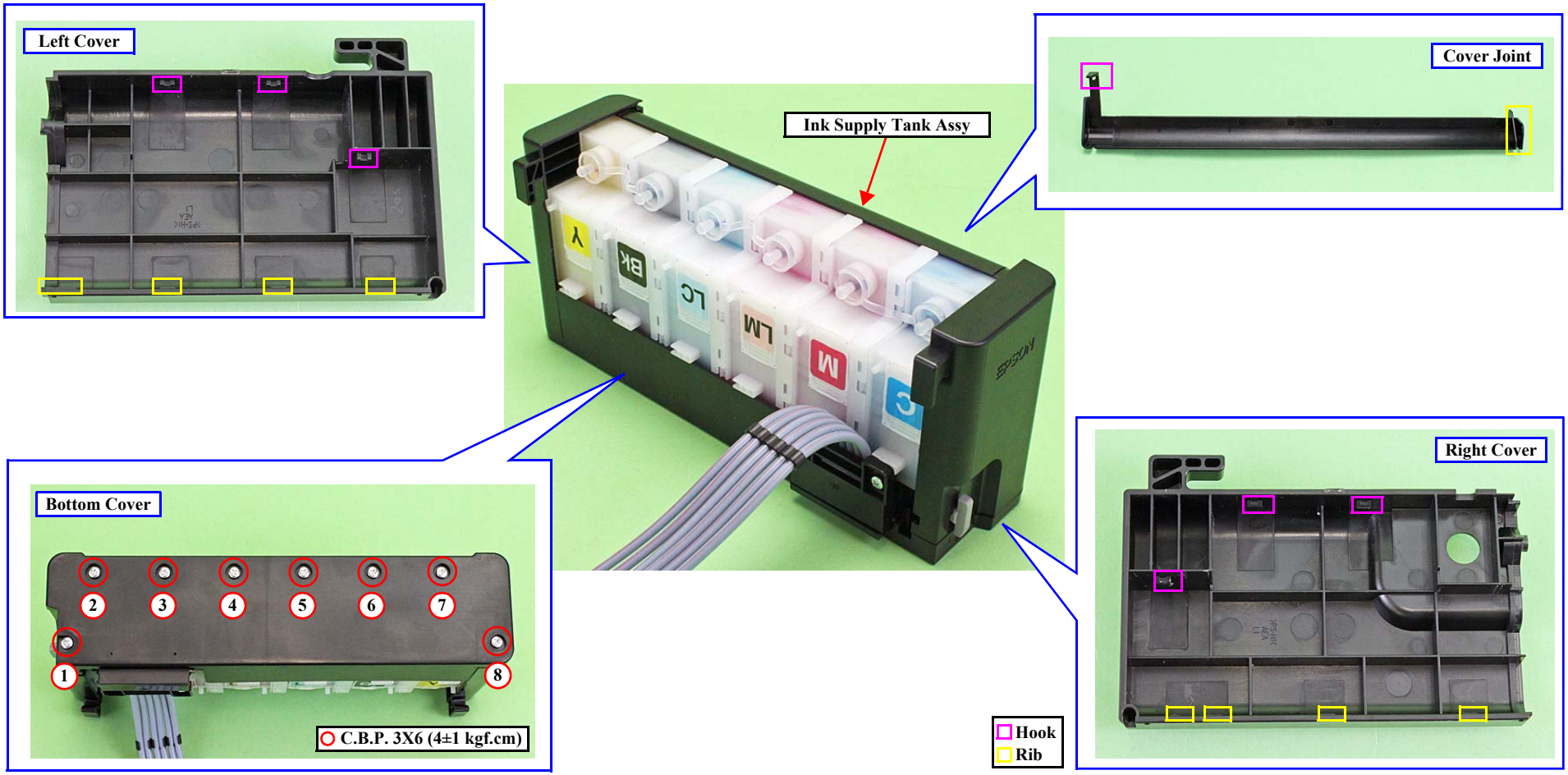
1. Remove the Ink Supply Tank Assy from the printer.
2. Insert a flathead precision screwdriver or the like into the gap between the Right Cover and the Tube Valve Holder Rear to release the hook of the Valve Lever, and then remove the Valve Lever.

3.7.4.5 Ink Supply Tank Assy



- Be careful not to damage or peel off the film of the Ink Supply Tank.
- Be careful about how to place the Ink Supply Tank Assy in order to prevent printing failure from occurring. (See "How to place the Ink Tank Assy when disassembling/reassembling" (p.37).)

3.7.4.6 Bottom Cover/Left Cover/Right Cover/Cover Joint



!	Be careful about how to place the Ink Supply Tank Assy in order to prevent printing failure from occurring. (See "How to place the Ink Tank Assy when disassembling/reassembling" (p.37).)
	■ The figures above indicate the hooks and ribs that secure the parts. ■ Remove the exterior parts of the Ink Supply Tank Assy in the following order. 1. Remove the screws (x8) of the Bottom Cover, and remove the Bottom Cover. 2. Remove the Left Cover and Right Cover. 3. Remove the Cover Joint.
	Tighten the screws in the order indicated in the figure above.

CHAPTER

4

ADJUSTMENT

4.1 Adjustment Items and Overview

This chapter describes adjustments to be made after the disassembly/reassembly of this product.

4.1.1 Servicing Adjustment Item List

The items, purposes and outlines of the Adjustment Program are given in the following table.

Table 4-1. Adjustment Items

Adjustment	Purpose	Method Outline
PF Belt Tension Adjustment	This adjustment is made to reduce the load on the PF motor and to ensure paper feed accuracy.	See "4.3.1 PF Belt Tension Adjustment" *(p.122)*.
PF Roller Shaft Center Support Position Adjustment	This adjustment is made to compensate the deflection amount on the PF Roller Shaft and to maintain the appropriate paper feed amount.	See "4.3.3 PF Roller Shaft Center Support Position Adjustment" *(p.127)*.
ASF Guide Roller LDs Position Adjustment	This adjustment is made to optimize the positions of the LD Roller Shaft and Retard Roller in order to maintain the paper feed accuracy.	See "4.3.5 ASF Guide Roller LDs Position Adjustment" *(p.131)*.
PG Adjustment	This adjustment is made to ensure the correct distance between the head surface and the Front Paper Guide, and to adjust the parallelism between the 0 digit side and the 130 digit side to ensure consistent print quality.	See "4.3.2 PG Adjustment" *(p.124)*.
EEPROM Data Copy	This adjustment is made to read out the necessary information from the EEPROM using the D4 function. If this copy is completed successfully, all the other adjustments required after replacing the main board are no longer necessary.	1. Select this function in the Adjustment Program. 2. Read out the data from the defective board. 3. After replacing the board with a new one, write the read data to the new board.
Initial Setting	After replacing the Main Board, information common to Main Boards is written by market setting.	1. Select and execute this function in the Adjustment Program. 2. Write the initial settings to the EEPROM.
USB ID Input	A USB ID is given to each printer to identify a specific printer when using multiple printers of same model.	1. Select this function in the Adjustment Program and enter the serial number of the printer. 2. The correction value is saved to the specific EEPROM address of the Main Board.
Head ID Input	When replacing the Print Head, this adjustment is made to reduce head manufacturing variations, which may cause individual differences in print quality.	1. Enter the ID of the Head QR Code Label (24 digits), which is applied to the Print Head, into the program. 2. The ID is stored in the EEPROM of the Main Board. Supplement: Read the QR code label from left to right on the top row and from top to bottom in due order.)

Table 4-1. Adjustment Items

Adjustment	Purpose	Method Outline
Initialize PF deterioration offset	The deterioration amount of the PF Roller Shaft is reflected to the paper feed correction amount. Every time a sheet of paper is fed, the deterioration amount is counted on the basis of the original counter value setting.When the PF Roller Shaft or Printer Mechanism has been replaced during repair, the PF deterioration counter must be reset.	1. Select and execute this function in the Adjustment Program. 2. Reset the PF deterioration counter.
Disenable PF deterioration offset	The PF deterioration compensation counter can be reset only when the PF Roller Shaft is new. To reduce the ancillary work in servicing, enter the maximum value (value for which deterioration compensation is not made) if the PF Roller Shaft has not been replaced.	1. Select and execute this function in the Adjustment Program. 2. Reset the PF deterioration counter.
First dot position adjustment	This function adjusts the print starting position in the CR main scanning direction.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. Enter the value whose printed lines meet the adjustment pattern exactly 5 mm away from the left edge. 3. The correction value is saved to the specific EEPROM address of the Main Board.
PW adjustment	This adjustment is made to correct the PW Sensor mounting position on a software basis to improve a paper detection error caused by the variation of the mounting position.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. Select a pattern number 5mm away from each edge, and enter that number in the program. 3. The correction value is saved to the specific EEPROM address of the Main Board.
Head angular adjustment	This adjustment is made to correct the error in the Print Head mounting position (Head angle) to make the nozzle line straight with respect to the paper feeding direction. Angular displacement is also checked for.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. After checking the displacement amount of the pattern, enter the pattern number which has the smallest amount of displacement.
Bi-D adjustment	This adjustment is made to correct the print timing in the go and return paths in bi-directional printing.	1. Select and execute this function in the Adjustment Program. 2. Pattern printing and adjustment are automatically executed. Supplement: Be sure to confirm that there are no dots missing before executing this adjustment.
BAND printing adjustment	This adjustment is made to correct the mis-alignment of vertical lines and timing of printing at monochrome draft printing.	1. Select and execute this function in the Adjustment Program. 2. Pattern printing and select the adjustment value, and write it to the specific EEPROM address on the Main Board.
PF adjustment	This correction is made when the actual paper feed amount differs greatly from the theoretical value due to paper slip, PF roller tolerances, etc. during paper feed for printing.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. Select or measure the adjustment value, and write it to the specific EEPROM address on the Main Board.
PF band adjustment	This corrects variations in paper feed accuracy in the band print mode to achieve higher print quality.	1. Select this function in the Adjustment Program and print the adjustment pattern. 2. Select the adjustment value, and write it to the specific EEPROM address on the Main Board.

Table 4-1. Adjustment Items

Adjustment	Purpose	Method Outline
CR motor heat protection control	When replacing the Printer Mechanism, this adjustment is made to measure the load of Carriage sliding, and manufacturing variations of the CR Motor and the Power Supply Board to make the most of the motor capabilities in motor heat generation control. When the Power Supply Board, the CR Motor or the Carriage Shaft has been replaced individually or when the correction value of the EEPROM cannot be read out with the main board replacement, the correction value cannot be recalculated since the condition is the different from when it's new, therefore, enter the worst value (on which heat generation limit is easily imposed).	1. Select this function in the Adjustment Program. 2. Select the replacement parts and execute this function to measure automatically the variations and write the measurement values to the EEPROM on the Main Board.
PF motor heat protection control	When replacing the Printer Mechanism, this adjustment is made to measure manufacturing variations of the PF Motor and the Power Supply Board to make the most of the motor capabilities in motor heat generation control. When the Power Supply Board or the PF Motor has been replaced individually, or when the correction value of the EEPROM cannot be read out with the main board replacement, the correction value cannot be recalculated since the condition is the different from when it's new, therefore, enter the worst value (on which heat generation limit is easily imposed).	1. Select this function in the Adjustment Program. 2. Select the replacement parts and execute this function to measure automatically the variations and write the measurement values to the EEPROM on the Main Board.

Table 4-2. Maintenance Functions

Function Item	Purpose	Method Outline
Ink charge	This function is used for Print Head replacement to drain Shipping Liquid of the after-sales service part in the head flow path and simultaneously fill ink in the head flow path to make all nozzles printable and stabilize the ink in the Print Head.	1. Select this function in the Adjustment Program. 2. Transfer the factory-set command (CL execution command (Initial Ink Charge) is used as the command) to the printer to make the printer perform Initial Ink Charge operation.
Head cleaning	This function is used to execute cleaning 3 (CL3) when ink is not delivered from the Print Head properly, e.g. dot missing or skewed injection.	1. Select this function in the Adjustment Program. 2. Execute CL3.
Consumables maintenance counter	This function is used to read and reset the Protection Counters.	1. In the Adjustment Program, select value read or reset from this function. Make sure to replace the Waste Ink Pads managed by the protection counters before resetting the counter.

Table 4-3. Additional Functions

Function Item		Purpose	Method Outline
Final check pattern print	A4 size	Use this to check if the all adjustments have been properly made.	The all adjustment patterns are printed automatically.
	US Letter size		
EEPROM dump		Use this to read out the EEPROM data for analysis.	The all EEPROM data is automatically read out and stored as a file.
Printer information check	Manual CL counter	Use this to read out information on the printer operations.	The printer information is automatically read out.
	I/C exchange CL counter		
	Timer CL counter		
	Print path counter		

4.1.2 Required Adjustments

The table below lists the required adjustments depending upon the parts being repaired or replaced. Find the part(s) you removed or replaced, and check which adjustment(s) must be carried out.

Table 4-4. Required Adjustment List

Priority		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Part Name \ Adjustment Item		PF Belt tension adjustment	PF Roller Shaft Center Support Position adjustment	ASF Guide Roller LDs Position Adjustment	PG Adjustment	EEPROM Data Copy	Initial setting/USB ID Input	Head ID input	Consumables maintenance counter	Ink charge	Initialize PF deterioration offset	Disenable PF deterioration offset	First dot position adjustment	PW adjustment	Head angular adjustment	Bi-D adjustment	BAND printing adjustment	PF adjustment	PF band adjustment	CR motor heat protection control	PF motor heat protection control	Final check pattern print
ASF Assy	Remove	---	---	*1	---	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	---	O
	Replace	---	---	O	---	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	---	O
CR Motor	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
Printhead	Remove	---	---	---	O	---	---	---	---	---	---	---	O	O	O	O	O	---	---	---	---	O
	Replace	---	---	---	O	---	---	O	---	O	---	---	O	O	O	O	O	---	---	---	---	O
Main Board	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace (Read OK)	---	---	---	---	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace (Read NG)	---	---	---	---	---	O	O	*2	---	---	O	O	O	O	O	O	O	O	O	O	O
PS Board	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O	O	O
Front Paper Guide/ Paper Eject Roller	Remove	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	O	O	O	---	---	O
PF Roller Shaft	Remove	O	O	---	O	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
	Replace	O	O	---	O	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
PF Motor	Remove	O	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	O	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O	O

Table 4-4. Required Adjustment List

Priority		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Part Name \ Adjustment Item		PF Belt tension adjustment	PF Roller Shaft Center Support Position adjustment	ASF Guide Roller LDs Position Adjustment	PG Adjustment	EEPROM Data Copy	Initial setting/USB ID Input	Head ID input	Consumables maintenance counter	Ink charge	Initialize PF deterioration offset	Disenable PF deterioration offset	First dot position adjustment	PW adjustment	Head angular adjustment	Bi-D adjustment	BAND printing adjustment	PF adjustment	PF band adjustment	CR motor heat protection control	PF motor heat protection control	Final check pattern print
Waste Ink Pad/ Front Paper Guide Pad	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	---	---	---	---	---	O
Carriage shaft	Remove	---	---	---	*3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	O	---	---	---	---	---	---	---	O	O	O	O	O	---	---	---	---	O
Carriage Unit	Remove	---	---	---	O	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	---	---	---	O	---	---	---	---	---	---	---	O	O	O	O	O	---	---	---	---	O
Paper EJ Frame Assy	Remove	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	O	O	---	---	O
Printer Mechanism	Remove	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	O
	Replace	O	---	O	O	---	---	---	---	---	O	---	O	O	O	O	O	O	O	O	O	O
PW Sensor	Remove	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	O
	Replace	---	---	---	---	---	---	---	---	---	---	---	---	O	---	---	---	---	---	---	---	O

CAUTION

- **When the EEPROM Data Copy cannot be made for the main board that needs to be replaced, the Waste Ink Pad must be replaced after replacing the main board with a new one.**
- **After all required adjustments are completed, use the "Final check pattern print" function to print all adjustment patterns for final check. If you find a problem with the printout patterns, carry out the adjustment again.**
- **When using a new main board for replacing the Printer Mechanism, the Initial setting must have been made to the main board.**

Note : "O" indicates that the adjustment must be carried out. "---" indicates that the adjustment is not required. If you have removed or replaced multiple parts, make sure to check the required adjustments for the all parts. And when multiple adjustments must be carried out, be sure to carry out them in the order given in the "Priority" row.

Note "*1" :When only removing the ASF Assy, you do not need to perform the adjustment. In that case, mark the installing positions before removing them, and make sure to align the markings when installing. See "3.4.6 ASF Assy" *(p71)*.

"*2" :Replacing the Waste Ink Pad is necessary when resetting waste ink pad counter.

"*3" :When only removing the Carriage Shaft, you do not need to perform the adjustment. In that case, mark on the Parallelism Adjust Bushing (Left/Right) before removing them, and make sure to align the markings when installing. See "3.4.5 Carriage Shaft / Carriage Unit" *(p63)*.

4.1.3 Required Adjustment Tools

The following table lists the adjustment tools required for adjustment of this product.

Table 4-5. List of Tools

No.	Name	Part Code	Category	Overview
1	Adjustment Program	–	Software	This adjustment program is designed to display the required adjustment items in the appropriate order when a replacement part is selected, and provides workers with the accurate adjustment order.
2	G-26	1080614	Grease	For the Parallelism Adjust Bushing, Lower Paper Guide, Driven Release Shaft, etc.
3	G-45	1033657	Grease	For the PF Roller, Front Paper Guide, Rear Paper Guide and etc.
4	G-71	1304682	Grease	For the Carriage Unit and Carriage Shaft.
5	PG Adjustment Gauge	1276333	Gauge	A gauge exclusively used to make PG Adjustment. Check the correction value by energizing it in the same way as for Stylus Photo R1800.
6	PF Tension Measuring Tool	1294120	Measuring tool	Used to check whether or not the tension of the PF Drive Belt is within the specified value. If load is greater than the specified value, the PF Motor may generate heat, burning off the coil. Reversely, if load is less than the specified value, the paper feed position may shift.
7	PF Roller Shaft Position Adjustment Jig	1304993	Adjusting jig	Used to check whether or not the deflection amount of the PF Roller Shaft is within the specified value. Adjustment values are confirmed in a pair with the level block.

Table 4-5. List of Tools

No.	Name	Part Code	Category	Overview
8	Level Block	1304994	Adjusting jig	Used to check whether or not deflection amount of the PF Roller Shaft is within the specified value. Adjustment values are confirmed in a pair with the PF Roller Shaft Position Adjustment Jig.
9	Spanner (M3)	Commercially available	Tool	Used to loosen the screw that secures the Center Support Bushing when performing PF Roller Shaft Center Support Position Adjustment.

4.2 Adjustment Using Adjustment Program

This section explains the adjustments using the Adjustment Program.

4.2.1 Head angular adjustment

The following pattern is printed. The lines on the top are printed while the carriage moves from the home to the other side (from 1 to 80 digit), and the lines at the bottom are printed while the carriage returns to the home (80 to 1 digit).

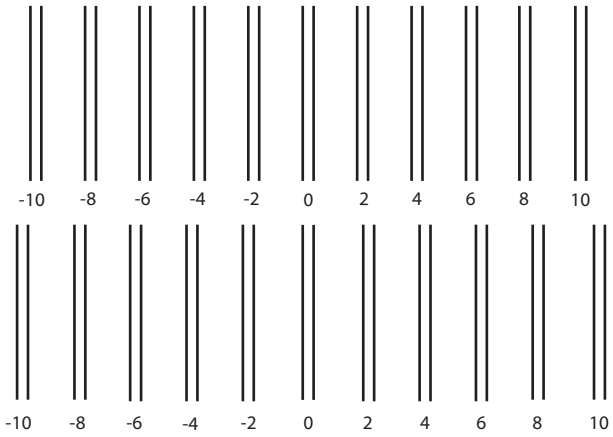


Figure 4-1. Head Angular Adjustment Printout Pattern

How to Judge

Examine the printout patterns and enter the value (-10 to 10) for the most straight lines.

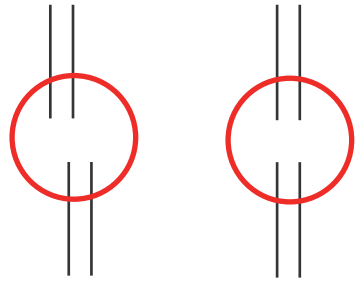
Additional information

In the following cases, reassemble or replace the Printhead and carry out the adjustment again.

- The difference between the adjusted values of 1 -> 80 and 80 -> 1 exceeds 8.
  The larger the difference is, the more the Printhead is tilted in the front-to-back direction. (Not parallel to the paper surface.)
- The average of the values of 1 -> 80 and 80 -> 1 falls outside the range from -4 to +4.
  The further the value is beyond the range, the more the Printhead is tilted in the left-to-right direction. (Not parallel to the paper edge.)

CHECK POINT

Example for judgement



4.2.2 PW Adjustment/First Dot Position Adjustment

Patterns are printed as shown below.

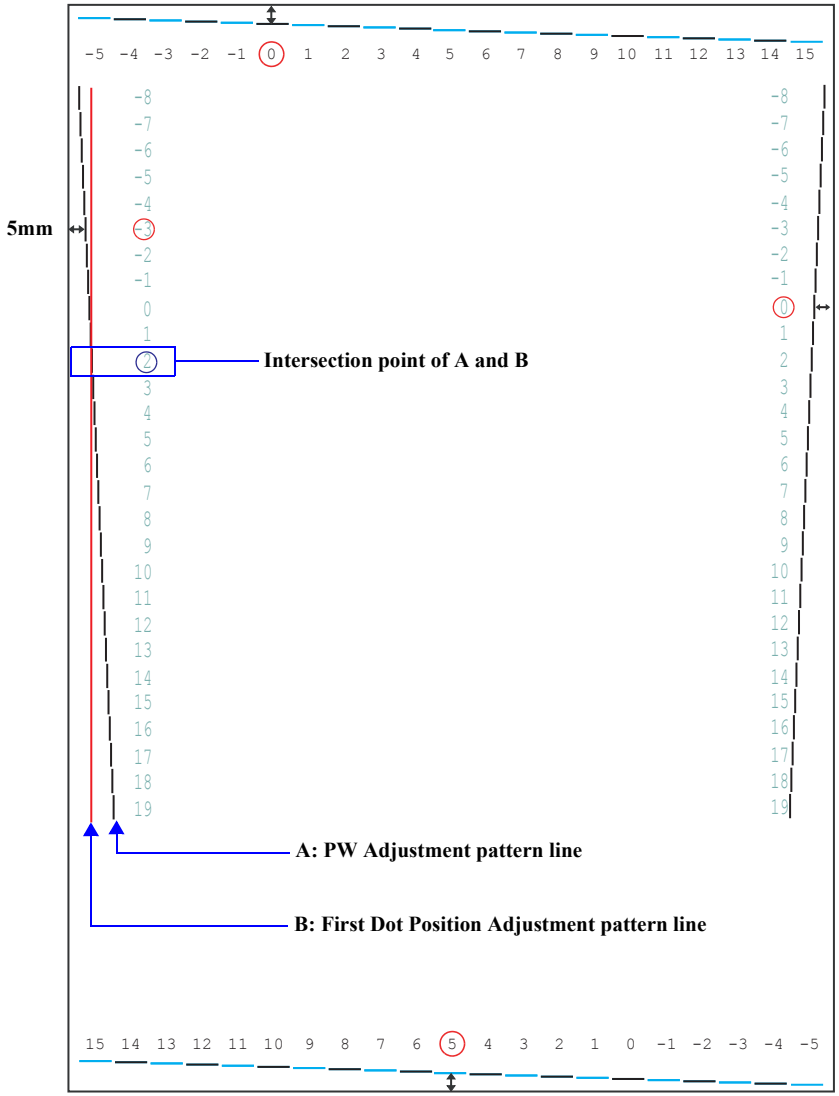


Figure 4-2. PW Adjustment Pattern/First Dot Position Adjustment Pattern

☐ **PW Adjustment**

How to Judge

Enter the value of the line located 5mm away from each edge.

Example: In the left figure, enter “0” (top), “5” (bottom), “-3” (left) and “0” (right).

☐ **First Dot Position Adjustment**

How to Judge

Enter the value of the point of intersection of the PW Adjustment pattern line and First Dot Position Adjustment pattern line on the left.

Measure the distance from the left edge of the paper to the printed line. Enter the value for the line that is exactly 5 mm away from the edge.

Example: In the left figure, enter “2” since the lines intersect at 2.

4.2.3 Bi-D adjustment

The pattern shown below is printed for each of the PG settings.

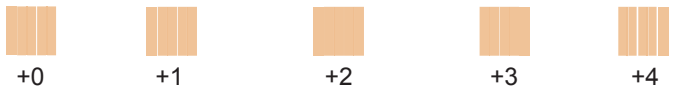


Figure 4-3. Bi-D Adjustment Printout Pattern

How to Judge

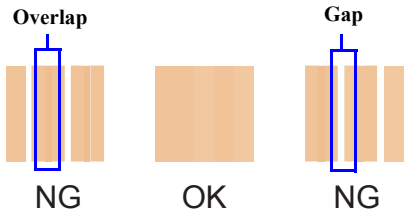
Examine the printout patterns for each of the five modes, and enter the value for the pattern with no gap and overlap for each mode.

Additional information

If no OK pattern is printed, enter the value for the best one, and print the adjustment pattern again.

CHECK POINT

Example for judgement



4.2.4 BAND printing adjustment

The following pattern is printed on two sheets each for Bi-d band adjustment and Pass offset adjustment with two dot sizes (ECO, VSD1).

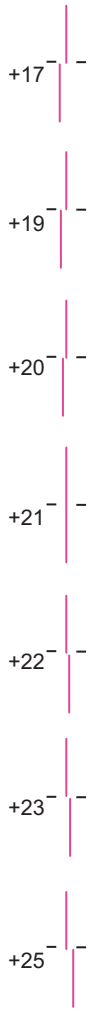


Figure 4-4. BAND printing adjustment Printout Pattern

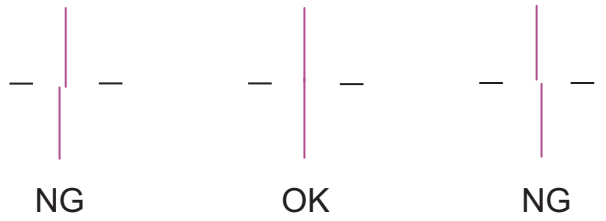
☐ **Bi-d band adjustment**

How to Judge

Examine the printout patterns and enter the values of the most straight lines.

CHECK POINT

Example for judgement



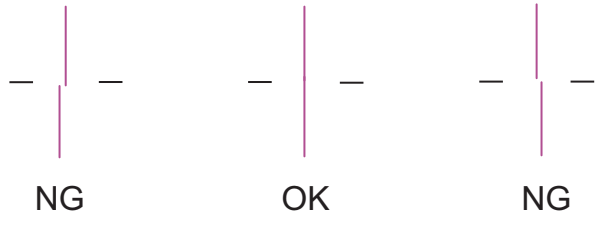
☐ **Pass offset adjustment**

How to Judge

Examine the printout patterns and enter the values of the most straight lines.

CHECK POINT

Example for judgement



4.2.5 PF adjustment

☐ **PF- for standard print area**

The following pattern is printed.

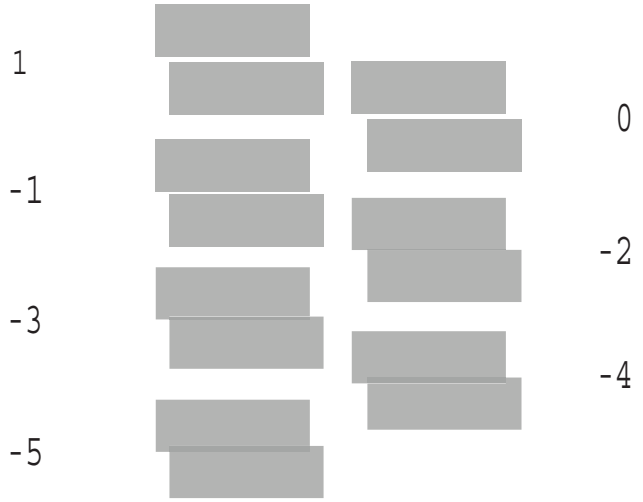


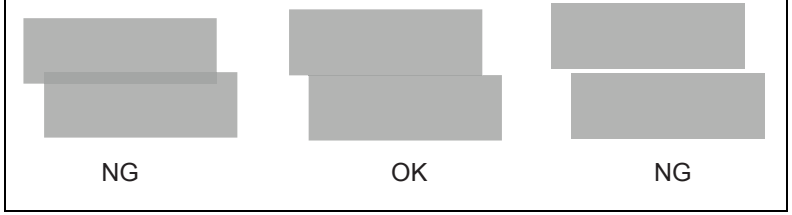
Figure 4-5. PF (standard print area) Adjustment Printout Pattern

How to Judge

Examine the printout patterns, and enter the value for the pattern with no overlap and gap between the upper and lower ones.

CHECK POINT

Example for judgement



☐ **PF- for bottom margin area**

The following pattern is printed.

How to Judge

Examine the printout patterns, and enter the value for the pattern with no overlap and gap between the upper and lower ones.

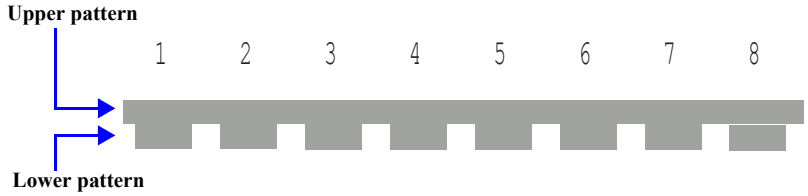


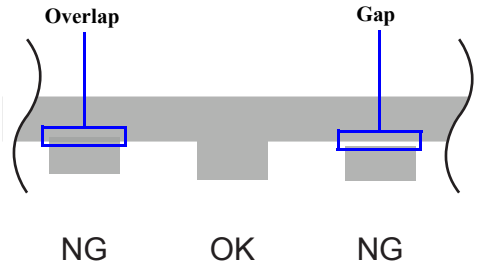
Figure 4-6. PF (bottom margin area) Adjustment Printout Pattern

Additional information

When overlap and gap are observed in the all patterns, enter the value for the best one, and print the adjustment pattern again.

CHECK POINT

Example for judgement



4.2.6 PF band adjustment

The following pattern is printed.

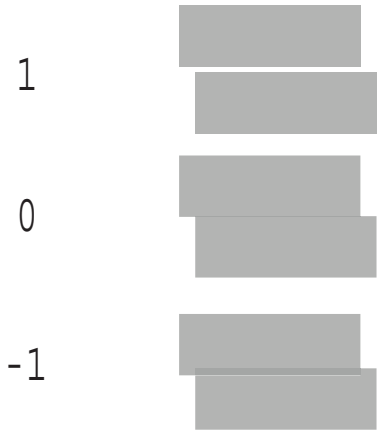


Figure 4-7. PF Band Adjustment Printout Pattern

How to Judge

Examine the printout patterns and enter the value for the pattern with no overlap and gap between the two rectangles.

Additional information

When overlap and gap are observed in the all patterns, enter the value for the best one, and print the adjustment pattern again.

CHECK POINT

Example for judgement

4.3 Adjustment without Using Adjustment Program

This section explains the adjustments that do not use the Adjustment Program.

4.3.1 PF Belt Tension Adjustment

When either of the following parts has been removed or replaced, this adjustment must be performed to reduce load on the PF Motor and to secure paper feed accuracy.

- PF Motor
- PF Roller Shaft
- Printer Mechanism

The PF Tension Measuring Tool is used for this adjustment.

Figure 4-8. PF Tension Measuring Tool

4.3.1.1 PF Belt Tension Adjustment Method

CAUTION

Proper measurement may be interrupted by sounds picked up from around. Make measurement in silent environment.

1. Secure the PF Motor to the Printer Mechanism, and install the Drive Belt on the Gear of the PF Scale and the Pinion Gear of the PF Motor.
2. Press the [POWER] button. The LCD of the Measuring Tool displays No. 0 and No. 1.
3. From among No. 0 to No. 9, select the channel you want to store its setting by pressing the [SELECT] button. The initial value may be selected as the channel.)
4. Press the [WEIGHT] button. The initial value will be displayed. Type the ten-key pad so that "1.2g/m" is displayed.
5. Press the [WIDTH] button. The initial value will be displayed. Enter "5.0 mm" with the ten-keypad.
6. Press the [SPAN] button. The initial value will be displayed. Enter "48mm" with the ten-keypad.
7. Bring the Microphone as close as possible to the center of the Timing Belt.

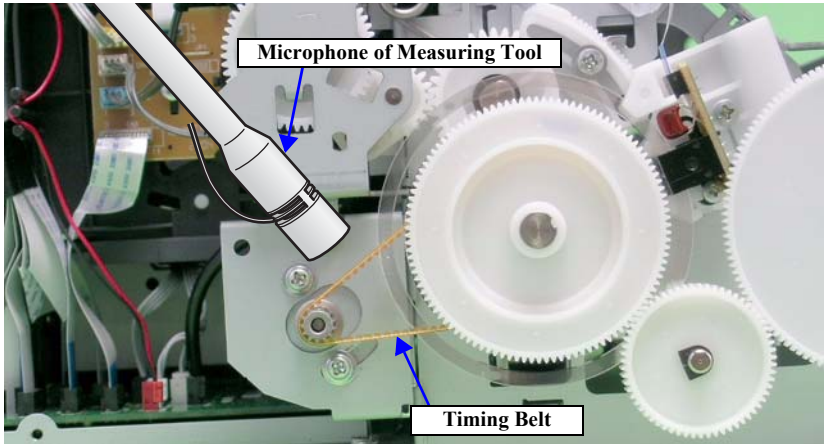


Figure 4-9. Microphone Position

CAUTION

As the Drive Belt is flipped with the tip of tweezers in the following steps, carefully choose the flipping position so that the Belt will not make contact with the Microphone by reaction of flipping.

8. Press the [MEASURE] button. ("----" is displayed on the LCD screen.)
9. Put the tip of the tweezers on the Drive Belt, and flip it downward in that position. The "----" displayed on the LCD will become wave pattern during the measurement. When it has finished, the measurement result will be displayed by "N" (Newton) after the beep. This jig can pick up and measure sounds accurately, regardless of the flipping force.
10. Repeating 8 and 9, delicately shift the variable part of the PF Motor mounting position to adjust the tension until the tension falls within the allowable standard value.

ADJUSTMENT REQUIRED

Standard Value: 11.5 ± 0.5Nm (11 to 12Nm)

CAUTION

- **Even if the Timing Belt is flipped, the LCD screen may not change at all. In this case, flip the Timing Belt again after a few seconds have passed.**
- **If measurement results differ greatly from each other, acoustic sounds may not be picked up properly in any of the measurements. Therefore, flip the Timing Belt again with the tweezers, and record the value at which two measurement results are approximate. Displaying errors in the range 1/100 to 5/100, the Measuring Tool has high reliability.**

4.3.2 PG Adjustment

CHECK POINT

- **Some pictures used in this section are Stylus Photo R1800. The adjustment method for L1800 is the same as the one for Stylus Photo R1800.**
- **When only removing the Carriage Shaft, you do not need to perform this adjustment. In that case, mark the position of the rib on the Parallelism Adjust Bushing (Left/Right) before removing them, and make sure to align the markings with the ribs when installing them.** *(Refer to 3.4.5 Carriage Shaft / Carriage Unit (p63).)*

When any of the following parts has been removed or replaced, this adjustment must be performed to secure the specified clearance between the print surface of the Print Head and paper.

- Print Head
- PF Roller Shaft
- Carriage Unit
- Carriage Shaft (Including the case when just moved the Parallelism Adjust Bushing)
- Printer Mechanism

In this adjustment, use the same Adjustment Gauge on the left and right sides.

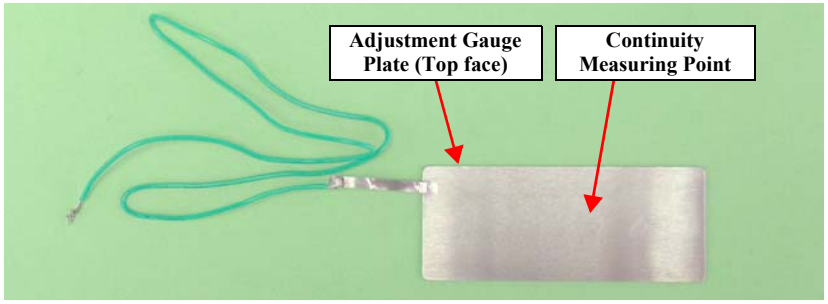


Figure 4-10. Adjustment Gauge

CAUTION

- **Do not touch the Adjustment Gauge Plate surface with bare hands.**
- **If the Adjustment Gauge Plate surface is stained by ink or, etc wipe it with a soft cloth.**

4.3.2.1 PG Adjustment Method

CAUTION

- **Before starting PG adjustment, completely wipe drops of ink around the Print Head. Remaining drops of ink will stick to the continuity measurement portion of the Adjustment Gauge, and generate continuity before the continuity measurement portion makes contact with the metal frame around the Print Head, interrupting accurate PG Adjustment.**
- **As the ink in the Print Head may stick fast and damage the Print Head during PG Adjustment, make the continuity time detected with a tester as short as possible. (Maximum 3 minutes)**

1. Install the printer on a level base.

CAUTION

Place the printer on a level, warp-free table. Normal PG Adjustment cannot be performed on a warped table.

2. Connect the Tester to the printer frame and Adjustment Gauge.

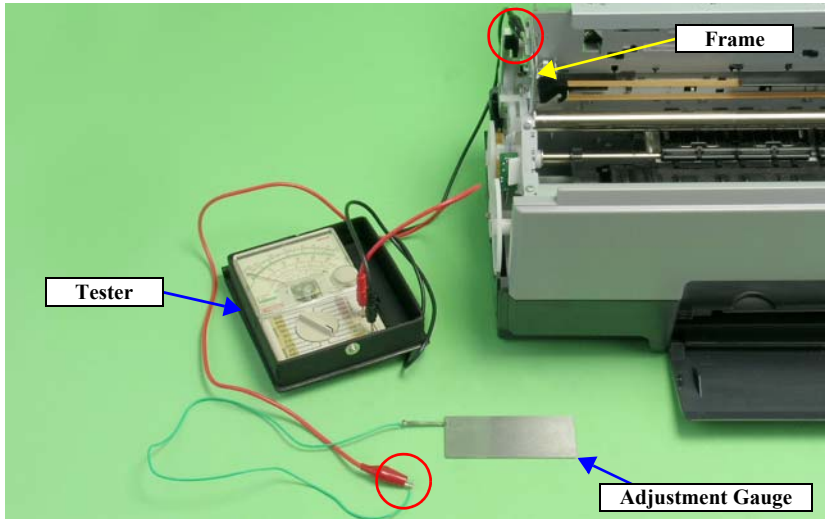


Figure 4-11. Connecting the Tester

3. Load Adapter of all colors into the Carriage Unit.
4. Loosen the screw that secures the Parallelism Adjust Bushing.
5. Turn the Parallelism Adjust Bushing upward to align the frame edge and the bottom of the Parallelism Adjust Bushing gear.

CAUTION

When the Parallelism Adjust Bushing is turned upwards, the frame rises up and PG narrows. Make sure that the frame does not come into contact with the Print Head when performing the following procedure.

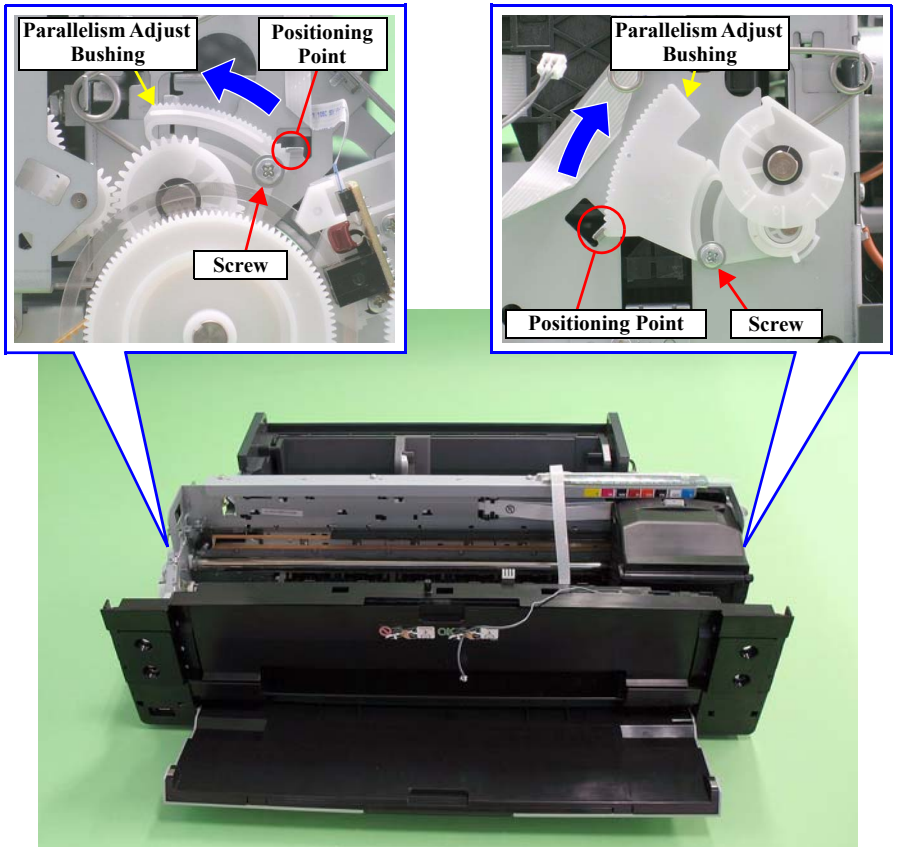


Figure 4-12. Setting the Parallelism Adjust Bushing

6. With its conductor connection portion up, set the Adjustment Gauge in the specified position (on the left side of the Front Paper Guide).
   - Setting Position
     Rear direction: Align the rear end of the Gauge with the Driven Roller Shaft of the Upper Paper Guide.
     Left direction: Release the left end of the Gauge from the Tab on the Front Paper Guide in *Figure 4-13*.

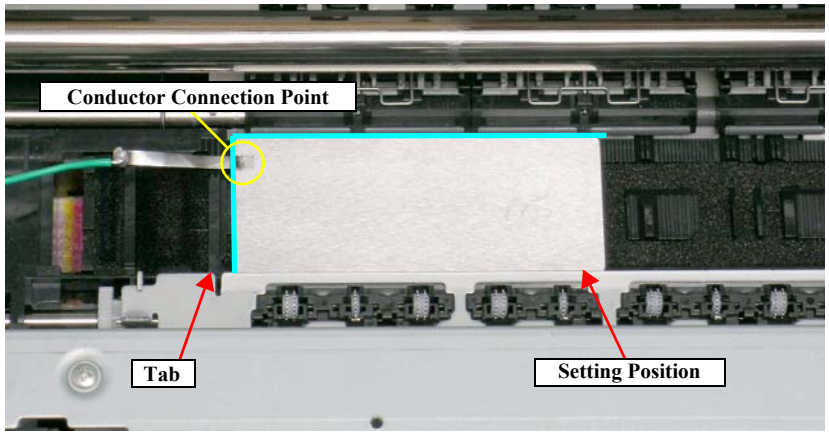


Figure 4-13. Setting the Adjustment Gauge

7. Move the Carriage Unit onto the Adjustment Gauge.
   - Moving position
     Align the left end of the Gauge with the left end of the Carriage Unit.

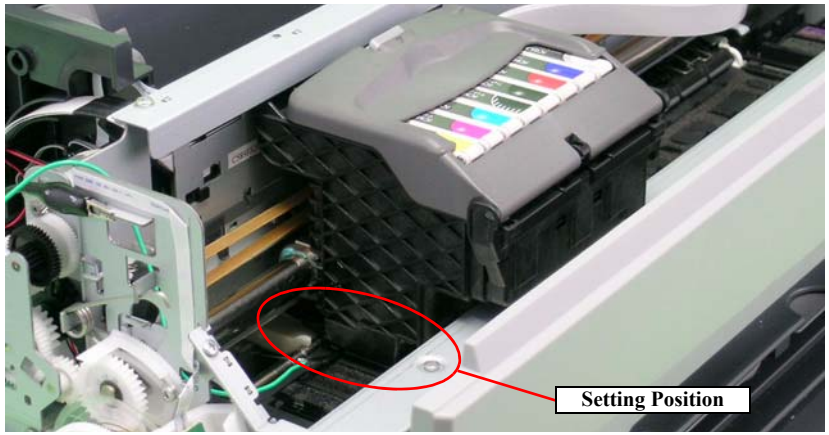


Figure 4-14. Moving the Carriage Unit

8. To set the PG position to the "--" position, turn the PG Cam on the right end of the Carriage Shaft clockwise so that the point marked "--" faces down.

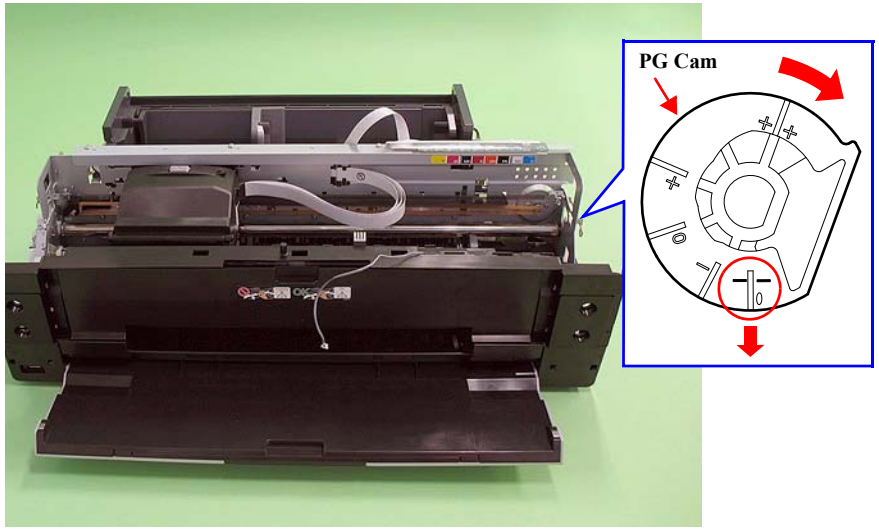


Figure 4-15. Markings of the PG Cam

ADJUSTMENT REQUIRED

- **PG Standard Value**
  - **PG – – (Minus Minus) :1.05mm~1.25mm**
  - **PG – (Minus) :1.2mm~1.4mm**
- **Adjustment Resolution :0.06mm**

9. Lower the Gear of the Parallelism Adjust Bushing on the left side of the frame stepwise, and confirm continuity. When continuity is confirmed, define the position where the Gear was raised one step up from the continuity position (where continuity is lost) as the left side PG position. Move the Parallelism Adjust Bushing at least twice to confirm that the continuity position and the non-continuity position are the same.

CHECK POINT

The following figure shows the states of the Adjust Parallel Bushing of the left side of the frame and the PG. This also applies to the Adjust Parallel Bushing on the right side of the frame.

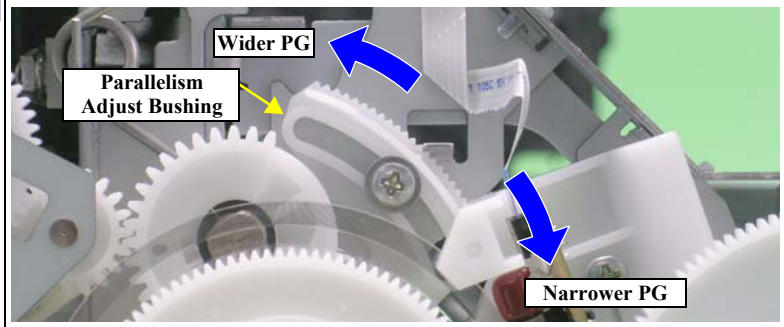


Figure 4-16. Relationship between Parallelism Adjust Bushing and PG

10. To set the PG position to "0" or more, turn the PG Cams on both ends of the Carriage Shaft CCW so that the point marked "0" (or "+" or "++") faces down.

11. With its conductor connection portion up, set the Adjustment Gauge in the specified position (on the right side of the Front Paper Guide).

- Setting Position

  Rear direction: Align the rear end of the Gauge with the Driven Roller Shaft of the Upper Paper Guide.

  Right direction: Release the right end of the Gauge from the Tab on the Front Paper Guide in *Figure 4-17*.

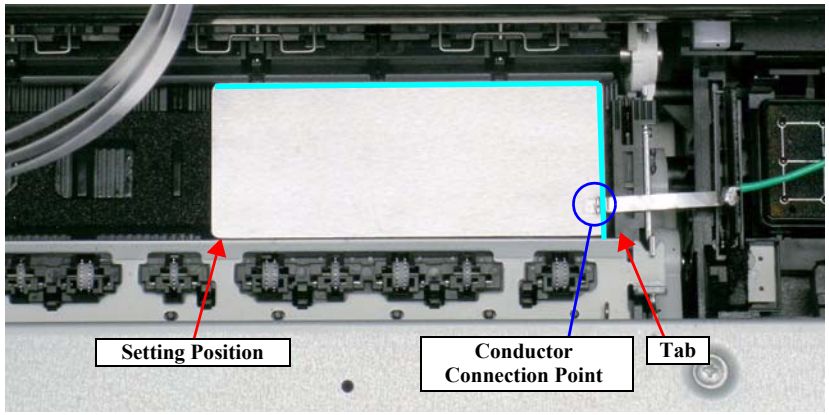


Figure 4-17. Setting the Adjustment Gauge

12. Move the Carriage Unit onto the Adjustment Gauge.
    - Moving position
      Align the right end of the Gauge with the right end of the Carriage Unit.

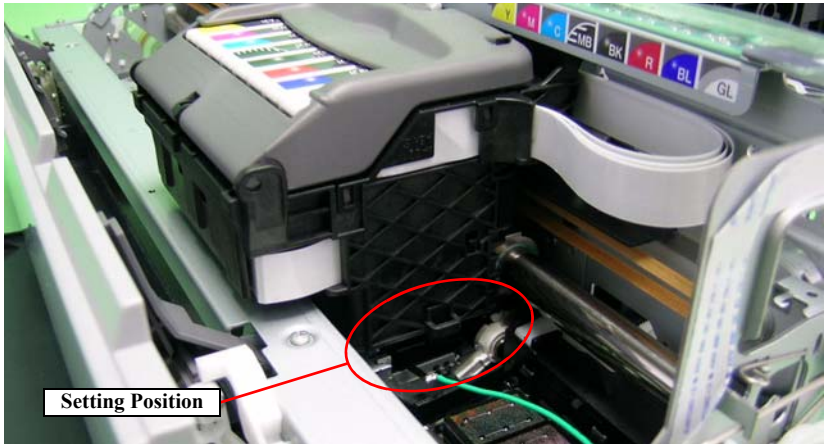


Figure 4-18. Moving the Carriage Unit

13. Return the PG position to "--".
14. As in step 9, move the Parallelism Adjust Bushing on the right side of the frame to set the right side PG position.
15. Set the PG position to 0 or more.
16. Set the Adjustment Gauge on the left side of the Front Paper Guide.
17. Move the Carriage Unit onto the left side Adjustment Gauge.
18. Return the PG position to "--".
19. Check continuity again at the PG position on the left side. If the PG position is not out of position, tighten the Parallelism Adjust Bushing with the screws to end the adjustment. If it is out of position, repeat the adjustment procedure from step 9.

4.3.3 PF Roller Shaft Center Support Position Adjustment

This adjustment must be performed to compensate the deflection amount on the PF Roller Shaft and to maintain an appropriate paper feed amount when the following parts are removed and replaced.

- PF Motor
- PF Roller Shaft

The PF Roller Shaft Position Adjustment Jig and Level block are used for this adjustment.

CHECK POINT

- **A substitute level block can be used if its surface accuracy is within 50µ.**
- **Use a Spanner (M3) to loosen the screw that secures the Center Support Bushing.**

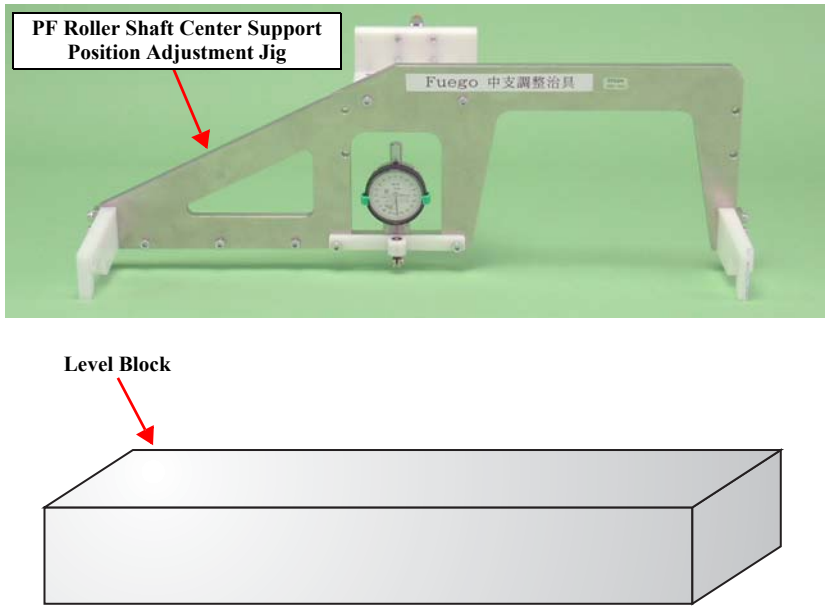


Figure 4-19. PF Roller Shaft Center Support Position Adjustment Jig and Level Block

4.3.4 How to Adjust the PF Roller Shaft Center Support Position

1. Before performing this adjustment, remove the following parts:
   - Lower Housing *(Refer to 3.4.4 Lower Housing / Printer Mechanism (p61).)*
   - ASF Assy *(Refer to 3.4.6 ASF Assy (p71).)*
   - Board Assy *(Refer to 3.3.1 Board Assy (Main Board/Power Supply Board) (p53).)*
   - Carriage Unit *(Refer to 3.4.5 Carriage Shaft / Carriage Unit (p63).)*
2. Install the printer on a level base.

CAUTION

Place the printer on a level, warp-free table. This adjustment cannot be performed correctly if it is performed on a warped table.

3. Set the PF Roller Shaft Position Adjustment Jig in place on the Level block, and perform zero adjustment.
   - Long hand position: Turn the dial to adjust the "0" position on the scale to the long hand position with the jig set in place on the Level block.
   - Short hand position: Check it.

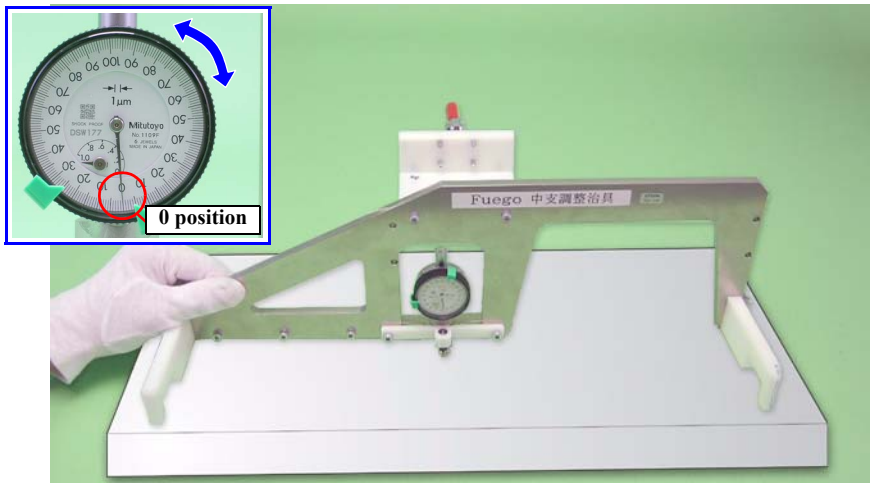


Figure 4-20. Setting the PF Roller Shaft Position Adjustment Jig (1)

4. Tilt the Printer Mechanism at about 45 degrees, and loosen the screws that secure the Center Support Bushing Cam and the Center Support Bush.

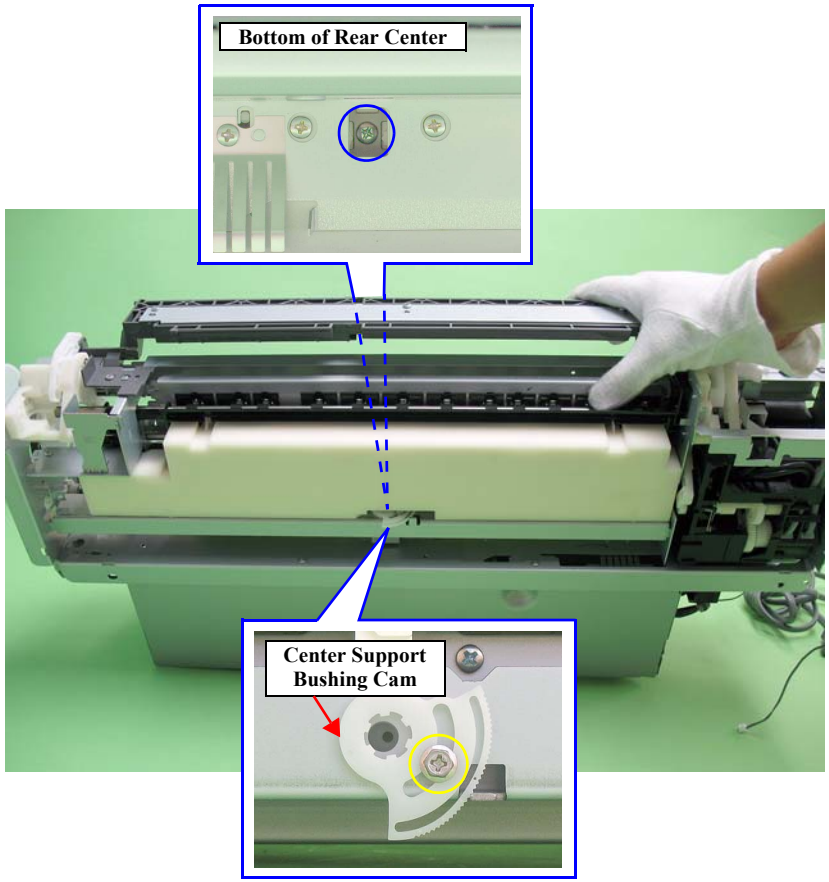


Figure 4-21. Center Support Bushing Cam and the Screw

CAUTION

Check for any dirt on the PF Roller Shaft when performing the following procedure.

5. Set the jig in place on the PF Roller Shaft as shown in the figure below.
   - Left side: Inside of PF Roller left end (E-ring)
   - Right side: Clearance between PF Roller right end (Right Bushing 8) and left end of Upper Paper Guide
   - Center: Clearance between the 2nd Upper Paper Guide and 3rd one from the left

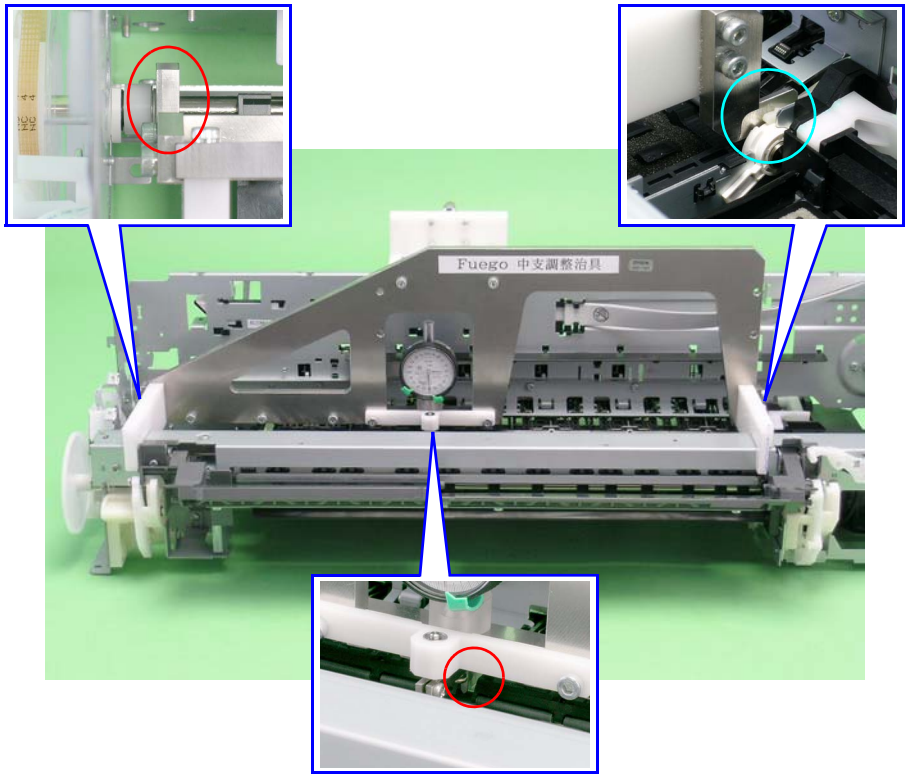


Figure 4-22. Setting the PF Roller Shaft Position Adjustment Jig (2)

6. Turn the Center Support Bushing Cam so that the long hand position is +30µ from the "0" adjustment position.

ADJUSTMENT REQUIRED

- **Standard Value: -10 ~ 40µ**
- **Adjustment Resolution: 50µ**

CAUTION

- **+30µ must be set to compensate for the thickness of the coating on the PF Roller Shaft.**
- **Make sure that the position of the short hand is the same as at "0" adjustment.**

CHECK POINT

The figure below shows the positional relationship between the Center Support Bushing Cam and the Dial Gage.

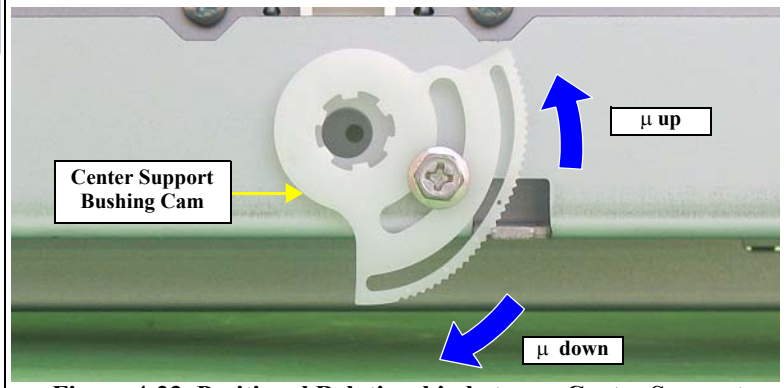


Figure 4-23. Positional Relationship between Center Support Bushing Cam and the Dial Gage

7. Tighten the Center Support Bushing Cam and the Center Support Bushing with the screws.

CAUTION

Check the adjustment value again as it deviates slightly when the screw is tightened.

The following page shows print samples when adjustment of the PF Roller Shaft Center Support Positions are inside and outside the specified value range.

Figure 4-24. Outside the Specified Value Range

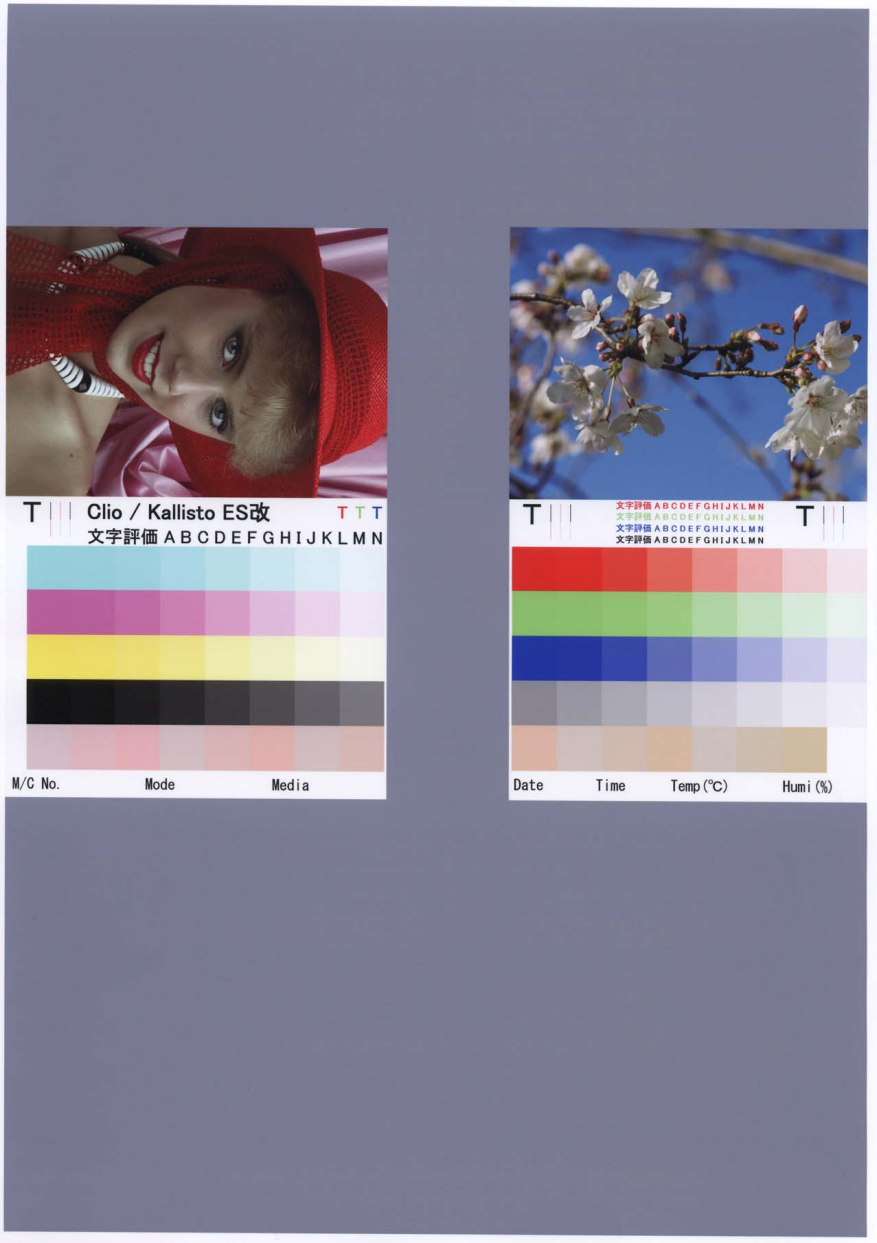


Figure 4-25. Inside the Specified Value Range

4.3.5 ASF Guide Roller LDs Position Adjustment

When installing the Guide Roller LDs, the position of the Guide Roller LDs must be adjusted so that the positions of the LD Roller Shaft and Retard Roller are optimized in order to maintain the paper feed accuracy.

4.3.5.1 Adjusting the Position of the ASF Guide Roller LDs

CHECK POINT

When only removing the ASF Assy, you do not need to perform this adjustment. In that case, mark the installing positions of the Guide Roller LDs before removing them, and make sure to align the markings when installing the Guide Roller LDs. *(Refer to 3.4.6 ASF Assy (p71).)*

1. After installing the *"3.4.6 ASF Assy" (p71)*, loosen the two C.B.S. M3x6 screws that secure the Guide Roller LD.

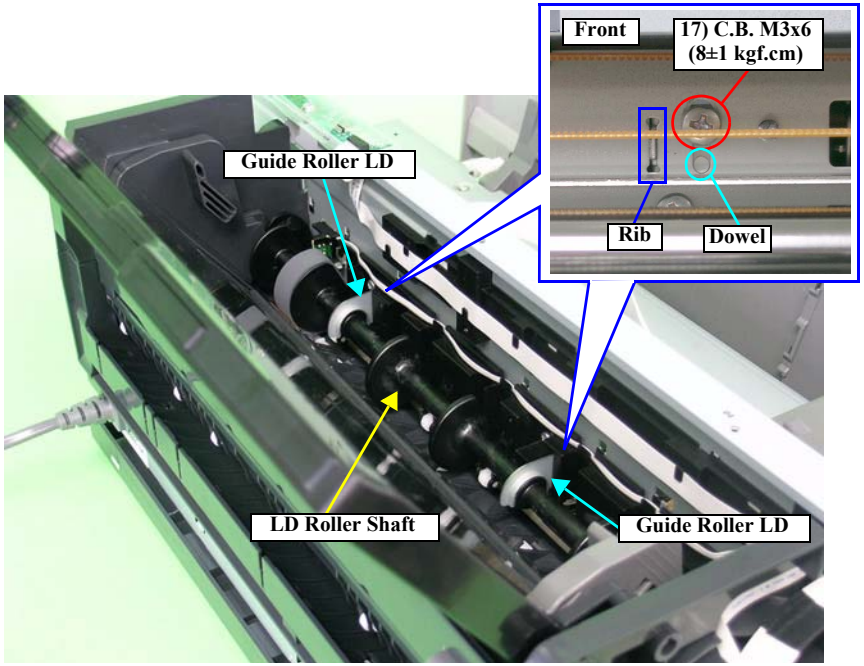


Figure 4-26. Guide Roller LD

2. Turn Combination Gear 29.11 on the right side of the ASF Assy CCW to raise the Hopper to the upper limit position (until the Hopper Pad contacts the LD Roller).

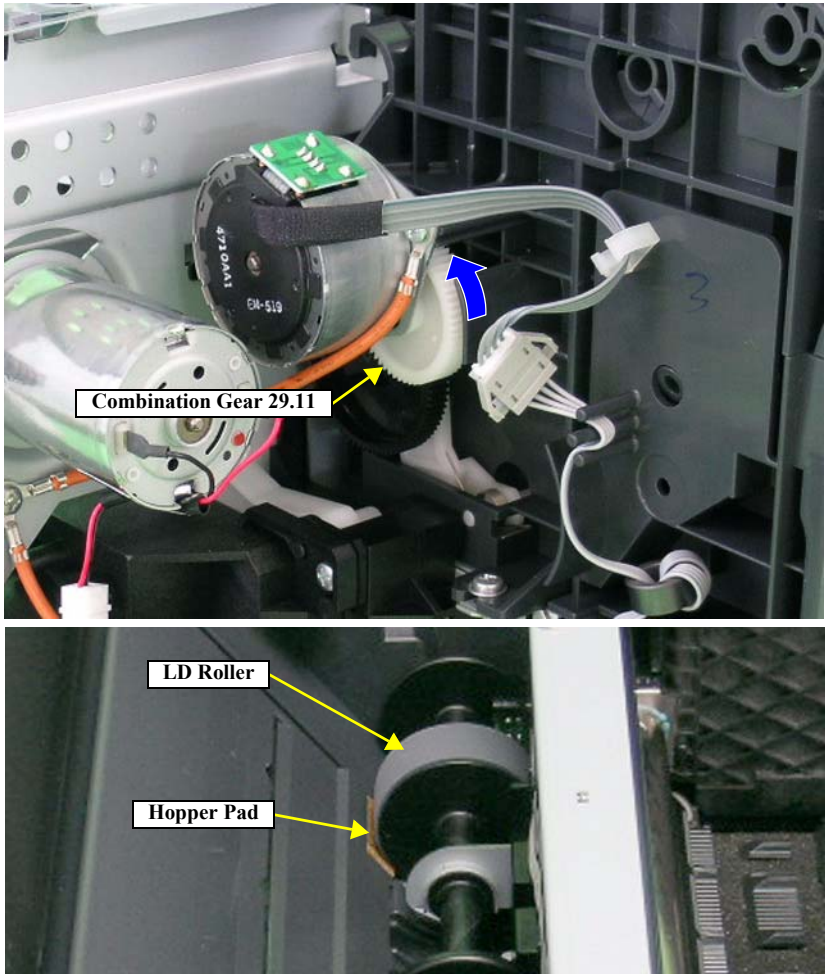


Figure 4-27. Raising the Hopper

3. Light the printer's inside through a gap between the Roll Paper Frame and the ASF Assy with a penlight, and look the tab on the Retard Roller Holder at the back of the two reference tabs on the ASF Assy through the notch. After making sure that the two reference tabs are aligned when viewed edge-on, adjust the position of the Retard Roller Holder Tab by pressing the Guide Roller LD (0 digit side) so that it is placed within the range as shown in the simplified diagram in Figure 4-28.

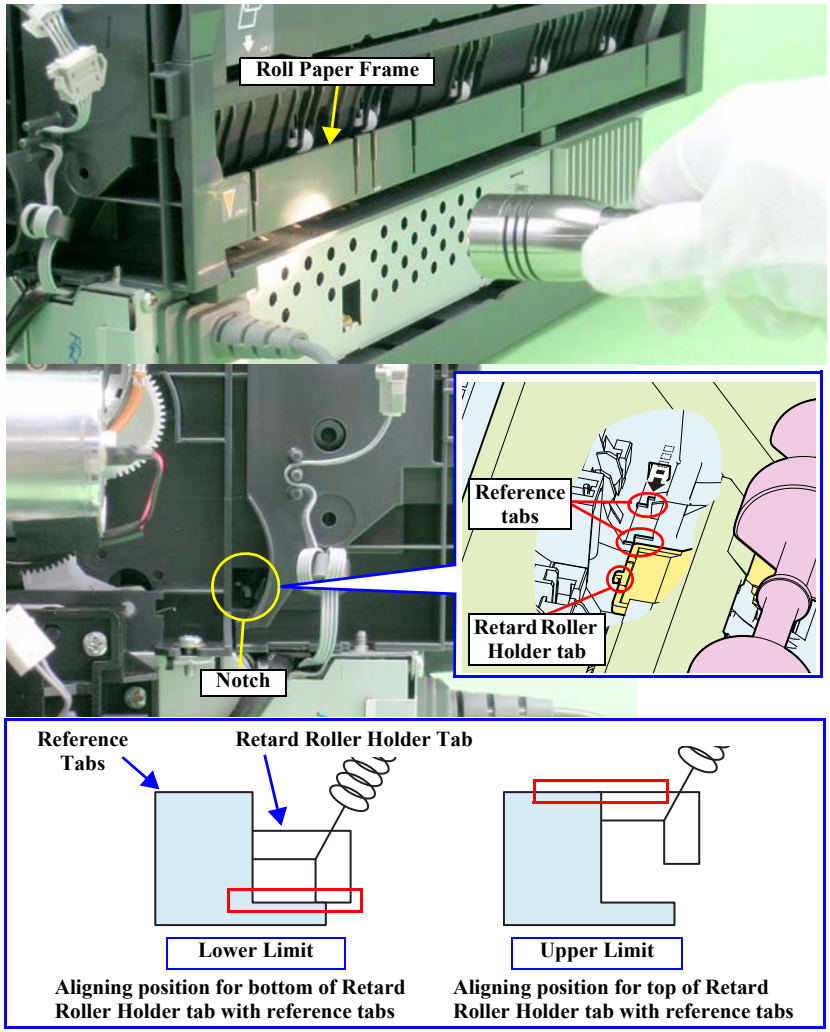


Figure 4-28. Aligning the Position of the Guide Roller LD (0 Digit Side)

4. Align the guide pin and tab on the 0 Digit Side Guide Roller LD with the positioning holes on the Main Frame, and tighten the Guide Roller LD (0 Digit Side) with the screws. *(See Fig.4-29.)*

5. Check the position of the Retard Roller Holder Tab again through the notch. If it is not inside the range, remove the screws on the Guide Roller LD (0 Digit Side), and repeat steps 2 to 4 to set the tab within the range.

6. Check the clearance in both ends of the positioning hole that the Guide Roller LD Tab is inserted. And align Guide Roller LD (130 Digit Side) to the same height, and tighten with the screws.

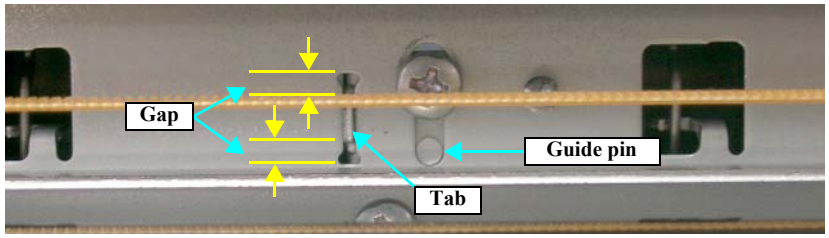


Figure 4-29. Checking the Position of Tab on the Guide Roller LD

CHECK POINT

The following are the possible troubles for misadjustment.

Tab Position	Trouble
Above upper limit	• Paper feed mistakes caused by non-feed • Skewing of business cards
Below lower limit	• Multiple-sheet feeding

CHAPTER

5

MAINTENANCE

5.1 Overview

This section provides information to maintain the printer in its optimum condition.

5.1.1 Cleaning

This printer has no mechanical components which require regular cleaning. Therefore, when returning the printer to the user, check the following parts and perform appropriate cleaning if stain is noticeable.

CAUTION

- **Never use chemical solvents, such as thinner, benzine, and acetone, to clean the exterior parts of the printer like the housing. These chemicals may degrade or deteriorate the quality of this product.**
- **Be careful not to damage any components when you clean inside the printer.**
- **Do not scratch the surface of the PF Roller assembly. Use a soft brush to wipe off dust.**
- **Use a soft cloth moistened with dilute alcohol to remove ink stain.**
- **Do not use the supplied cleaning sheet for normal usage. It may damage the coated surface of the PF Roller. If the adhesive surface of the cleaning sheet is set to the ASF LD Roller side and used to clean the ASF LD Roller surface, it is no problem.**
- **When using compressed air products; such as air duster, for cleaning during repair and maintenance, the use of such products containing flammable gas is prohibited.**

- Housing
  Use a clean soft cloth moistened with water and wipe off any dirt. If the Housings are stained with ink, use a cloth moistened with neutral detergent to wipe it off.
- Inside the printer
  Use a vacuum cleaner to remove any paper dust.

5.1.2 Service Maintenance

If print irregularity (missing dot, white line, etc.) has occurred or the printer indicates “Maintenance Error”, take the following actions to clear the error.

5.1.2.1 Head Cleaning

The printer has a built-in head cleaning function, which is activated by operating the control panel.The procedure is given below.

1. Confirm that the printer is in stand-by state.
   Check that the Power LED is not flashing.
2. Hold down the Ink Switch on the control panel for more than 3 seconds.
   The Power LED flashes during the cleaning sequence.

CHECK POINT

For Head Cleaning, it is recommended to run the nozzle check and the cleaning alternately to minimize ink consumption.

5.1.2.2 Maintenance Request

When the ink is used for the Print Head cleaning and such, it is drained via the Cap Unit to the Waste Ink Pad located on the Lower Housing. As for the ink absorbed by the Front Paper Guide Pad when carrying out the borderless printing or flushing operations, it is drained to the Front Paper Guide Pad. The amount of the waste ink is controlled with the Protection Counter A (Waste Ink Pad) and B (Front Paper Guide Pad) in the EEPROM on the Main Board. When the amount reaches the specified value; which indicates that the waste ink has reached the limit of the absorbing capability of the Waste Ink Pads, the “maintenance request error” is displayed.

- Timing for Replacing the Waste Ink Pads
  - When the Protection Counter has reached the limit and the “maintenance request error” is displayed
  - When servicing the printer, always check the Protection Counter using the Adjustment Program regardless of whether the Maintenance Request error has been indicated or not. If the counter is close to its upper limit, replace the Waste Ink Pads and reset the counter to “0” with receiving prior approval from the user. This prevents the printer from causing the Maintenance Request error soon after it is returned to the user.

- Waste Ink Pads to be replaced

Table 5-1. List of Waste Ink Pads to be replaced

Parts name	Qty.	Reference Pages
Waste Ink Pad	1	3.4.10 Waste Ink Pad (p79)

- After the Replacement
  Reset the Protection Counter (Refer to Chapter 4 Adjustment (p109))

5.1.3 Lubrication

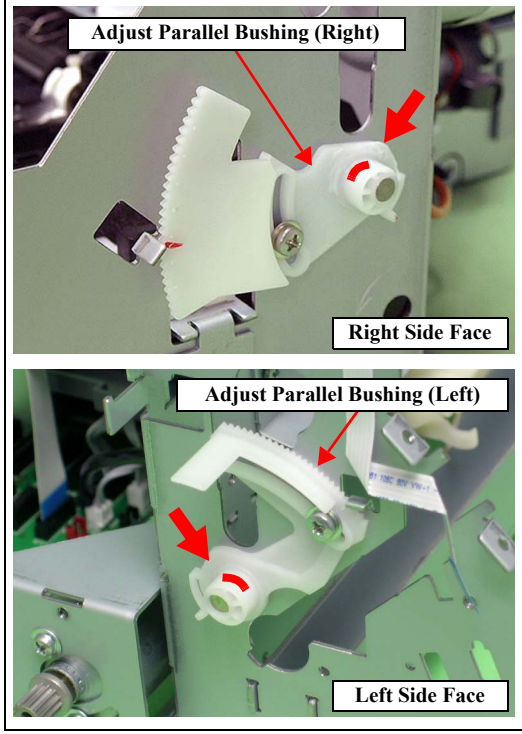
The lubrication used for the components of the printer has been decided on based on evaluation carried out by Epson. Therefore, the specified amount and places of lubrication given in this section should be strictly observed.

CAUTION

- **Never use oil or grease other than those specified in this manual. Use of different types of oil or grease may damage the components or affect the printer functions.**
- **Never apply a larger amount of oil or grease than specified in this manual.**

Table 5-2. Specified Lubricant

Type	Name	EPSON CODE	Supplier
Grease	G-26	1080614	EPSON
Grease	G-45	1033657	EPSON
Grease	G-71	1304682	EPSON
Grease	G-74	1409257	EPSON
Grease	G-75	TBD	EPSON



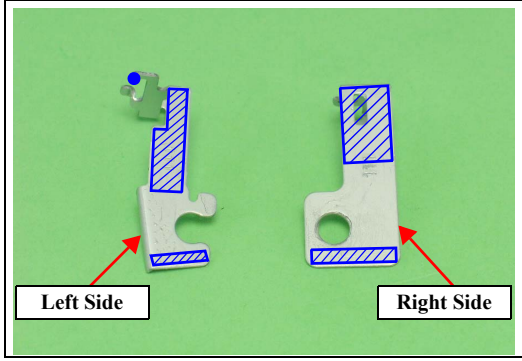
<Lubrication Point>
Left and Right Adjust Parallel Bushings (outer circumference)

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ1mm x 2mm

<Remarks>
- Apply with a syringe. (Pin Head: ϕ1mm)
- After lubrication, install and turn the PG Cam Bush to spread the grease evenly.

Figure 5-1. Lubrication (1)



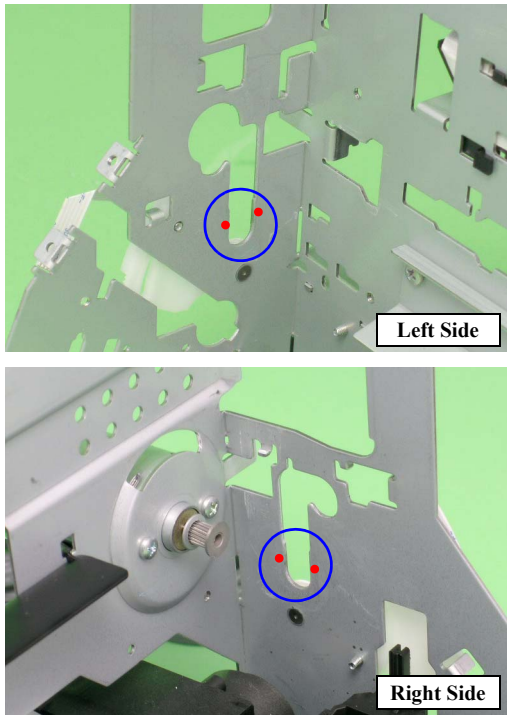
<Lubrication Point>
Contact point of the CR Scale Mounting Plate (Left/Right) and the Main Frame

<Lubrication Type>
G-26

<Lubrication Amount>
Apply evenly.

<Remarks>
Apply with a brush.

Figure 5-2. Lubrication (2)



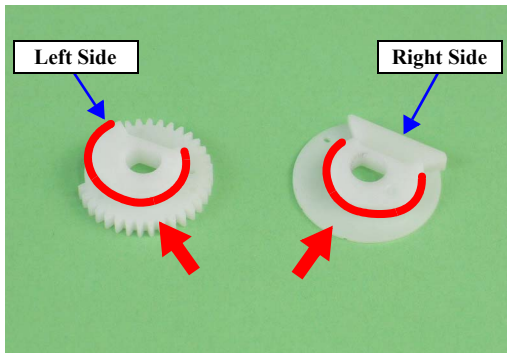
<Lubrication Point>
Contact point of the Main Frame and the CR the Scale Mounting Plate (Left/Right)

<Lubrication Type>
G-26

<Lubrication Amount>
A little at 4 points

<Remarks>
Apply with a brush.

Figure 5-3. Lubrication (3)



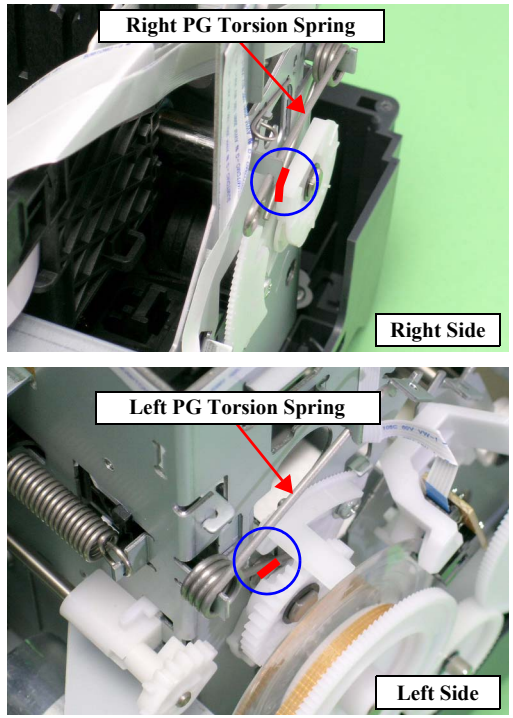
<Lubrication Point>
Bushings of the Left and Right PG Cams (inner circumference)

<Lubrication Type>
G-26

<Lubrication Amount>
1mm diameter of the inner circumference

<Remarks>
- Apply with a brush.
- Be careful not to attach the grease to the PF scale.

Figure 5-4. Lubrication (4)



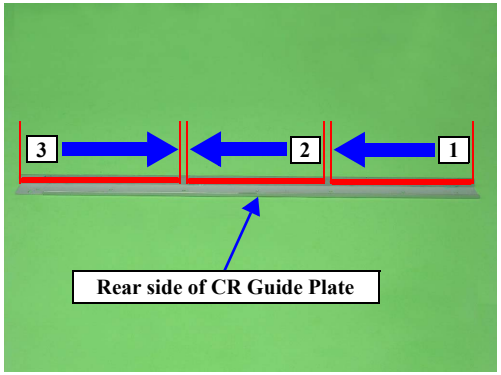
<Lubrication Point>
Contact point of the Left and Right PG Torsion Springs and the Carriage Shaft.

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ1mm x 2mm x 2 points

<Remarks>
Apply with a syringe.
(Pin Head: ϕ1mm)

Figure 5-5. Lubrication (5)



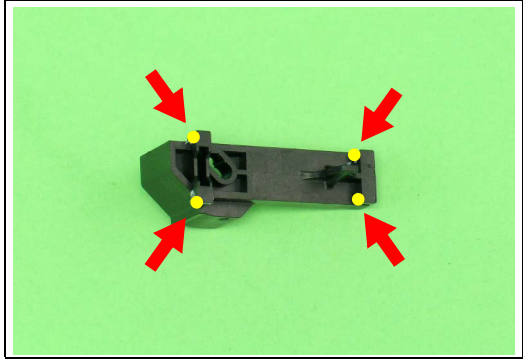
<Lubrication Point>
Contact point of the rear side of CR Guide Plate and the slider of the Carriage Unit

<Lubrication Type>
G-71

<Lubrication Amount>
70 ± 15mg x 3 points

<Remarks>
- Apply with a brush.
- Apply it in the order as shown with the arrows.

Figure 5-6. Lubrication (6)



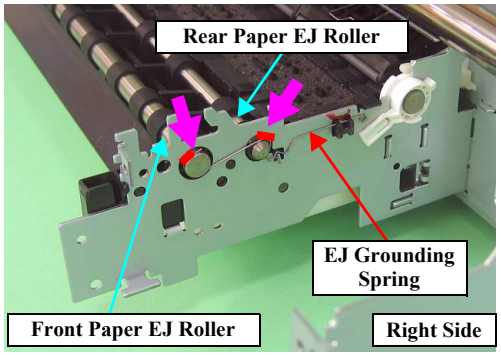
<Lubrication Point>
The Driven Pulley Holder

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ1mm x 2mm x 4 points

<Remarks>
Apply with a syringe.
(Pin Head: ϕ1mm)

Figure 5-7. Lubrication (7)



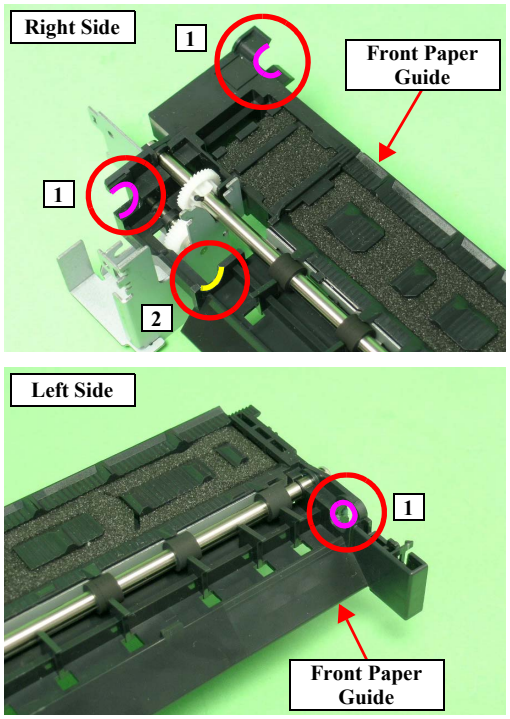
<Lubrication Point>
Contact point of the EJ Grounding Spring and Front and Rear Paper EJ Rollers

<Lubrication Type>
G-45

<Lubrication Amount>
ϕ1mm x 2mm x 2 points

<Remarks>
Apply with a syringe.
(Pin Head: ϕ1mm)

Figure 5-8. Lubrication (8)



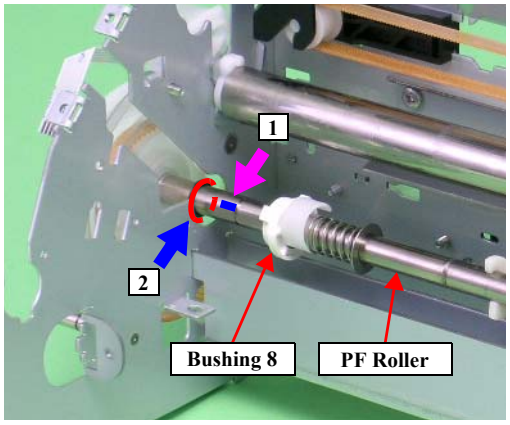
<Lubrication Point>
The bushing of the Front Paper Guide

<Lubrication Type>
G-45

<Lubrication Amount>
1. Apply evenly.
2. ϕ1mm x 2mm

<Remarks>
Apply with a brush.

Figure 5-9. Lubrication (9)



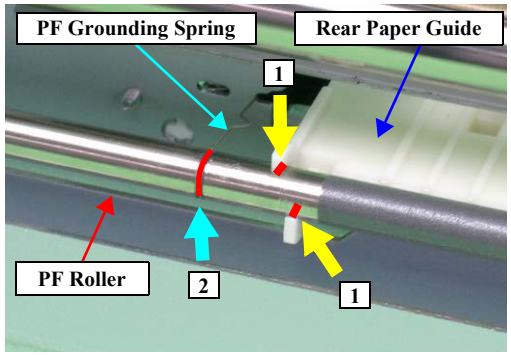
<Lubrication Point>
1. Left side of the PF Roller Shaft (Left of the E-Ring)
2. Mounting location of the Bushing 8

<Lubrication Type>
G-45

<Lubrication Amount>
1. Approx. ϕ1mm x 5mm
2. All around the Shaft

<Remarks>
1. Apply with a syringe.
2. Apply with a brush.

Figure 5-10. Lubrication (10)



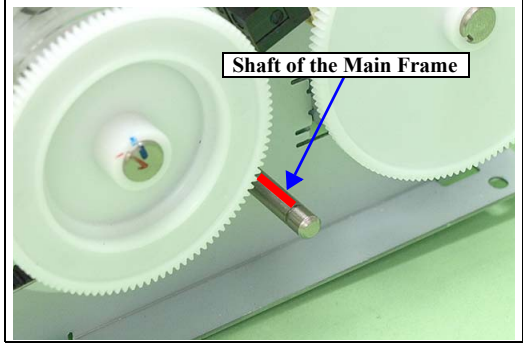
<Lubrication Point>
1. Contact point of the Rear Paper Guide and the PF Roller
2. Contact point of the PF Grounding Spring and the PF Roller

<Lubrication Type>
G-45

<Lubrication Amount>
1. Apply evenly.
2. ϕ1mm x 2mm

<Remarks>
1. Apply with a brush.
2. Apply with a syringe. (Pin Head: ϕ1mm)

Figure 5-11. Lubrication (11)



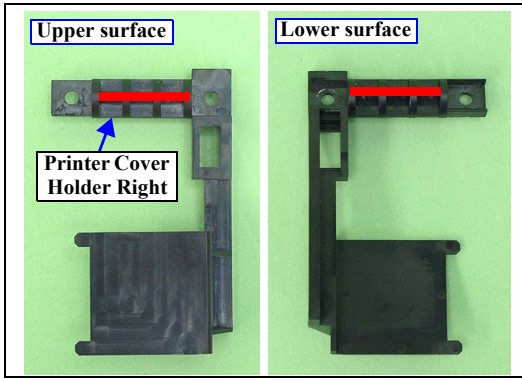
<Lubrication Point>
Contact point of the Shaft of the Main Frame and Spur Gear 31.5

<Lubrication Type>
G-45

<Lubrication Amount>
ϕ1mm x 2mm

<Remarks>
Apply with a syringe.

Figure 5-12. Lubrication (12)



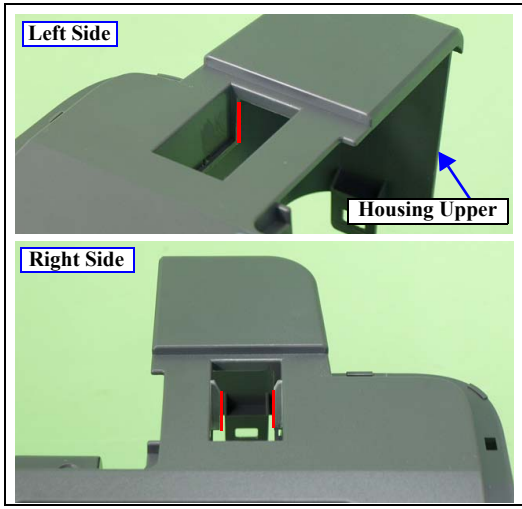
<Lubrication Point>
Contact point of the Printer Cover Holder (Left/Right) and the Printer Cover

<Lubrication Type>
G-26

<Lubrication Amount>
20mm x 2mm x 2 points

<Remarks>
Apply with a brush.

Figure 5-13. Lubrication (13)



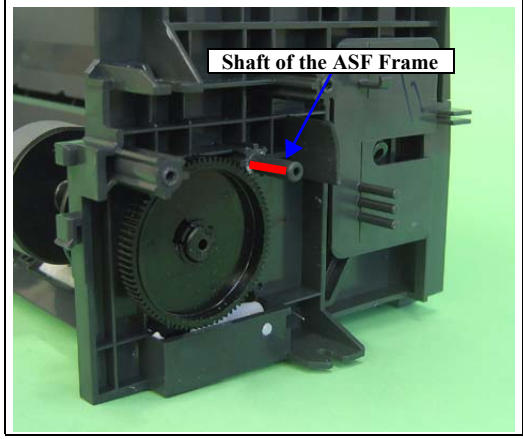
<Lubrication Point>
Contact point of the Housing Upper and the Printer Cover

<Lubrication Type>
G-74

<Lubrication Amount>
Apply evenly.

<Remarks>
Apply with a brush.

Figure 5-14. Lubrication (14)



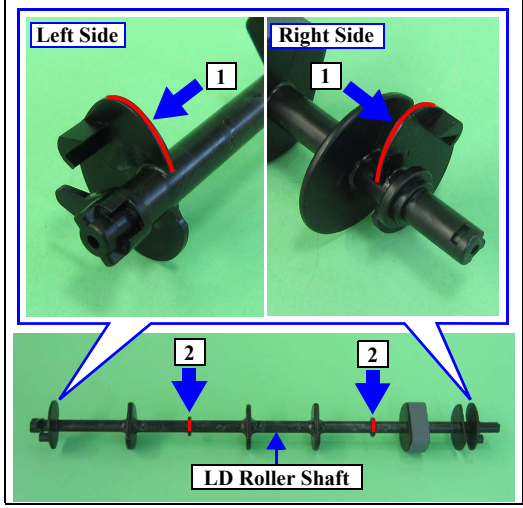
<Lubrication Point>
Contact point of the Shaft of the ASF Frame and the Combination Gear 29.11

<Lubrication Type>
G-26

<Lubrication Amount>
Apply evenly.

<Remarks>
Apply with a brush.

Figure 5-15. Lubrication (15)



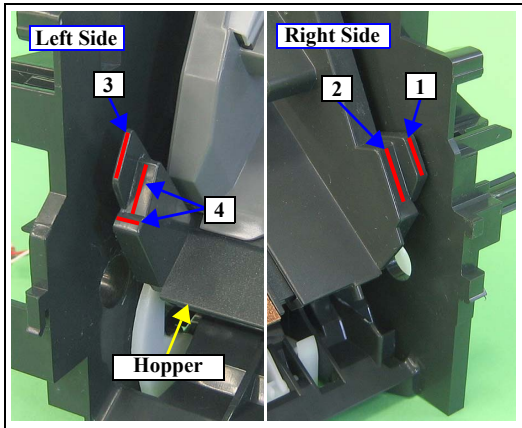
<Lubrication Point>
1. Contact point of the LD Roller Shaft and the Hopper
2. Contact point of the LD Roller Shaft and the Guide Roller LD

<Lubrication Type>
1. G-26
2. G-75

<Lubrication Amount>
Apply evenly.

<Remarks>
Apply with a brush.

Figure 5-16. Lubrication (16)



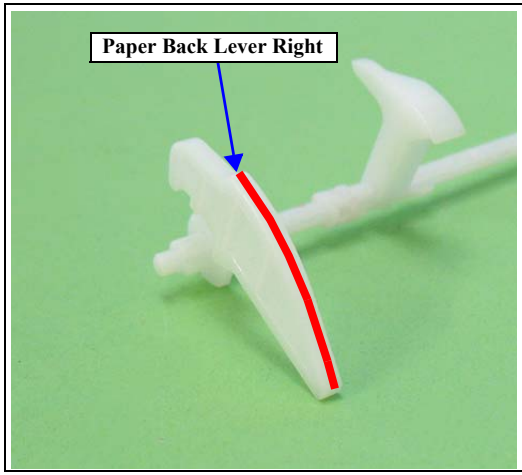
<Lubrication Point>
Contact point of the Housing Upper and the Printer Cover

<Lubrication Type>
G-26

<Lubrication Amount>
1. ϕ1mm x 10mm
2. ϕ1mm x 15mm
3. ϕ1mm x 10mm
4. Apply evenly.

<Remarks>
1. 2. 3. Apply with a syringe.
4. Apply with a brush.

Figure 5-17. Lubrication (17)



<Lubrication Point>
Contact point of the Paper Back Lever Right and the LD Roller Shaft

<Lubrication Type>
G-26

<Lubrication Amount>
ϕ2mm x 15mm

<Remarks>
Apply with a syringe.

Figure 5-18. Lubrication (18)

5.1.3.1 Lubrication of Carriage Shaft

1. Fit the Carriage Unit onto the Carriage Shaft, and move it to the center of the Shaft.

CAUTION

In the following step, do not bring the needle of a syringe into contact with the Carriage Shaft.

2. Using a syringe, lubricate the holes (2 places) at both ends of the Carriage Unit rear side with grease.

Lubrication Type	Lubrication Amount
G-71	140mg ± 10mg x 2 points

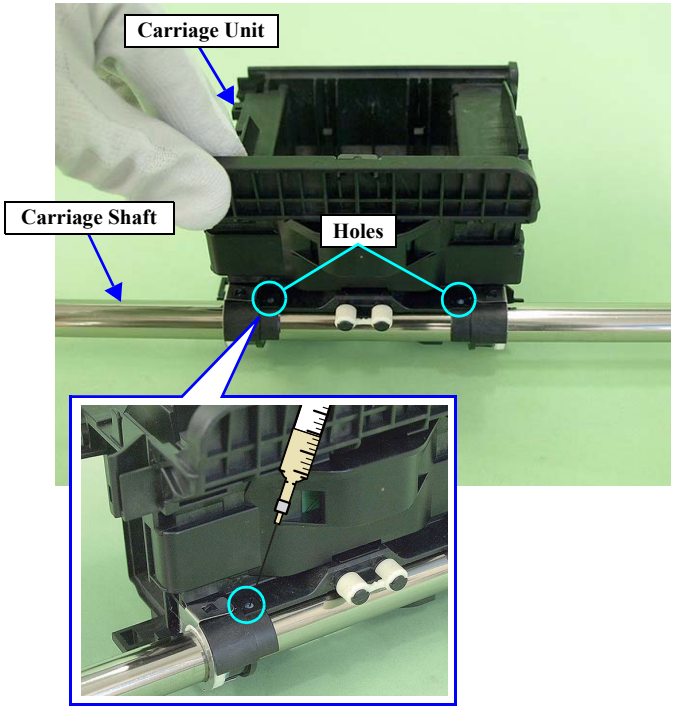


Figure 5-19. Lubricating the Carriage Shaft (1)

3. Hold the Carriage Unit, and while turning the Carriage Shaft clockwise and counterclockwise, move the Carriage Unit to spread the grease evenly.

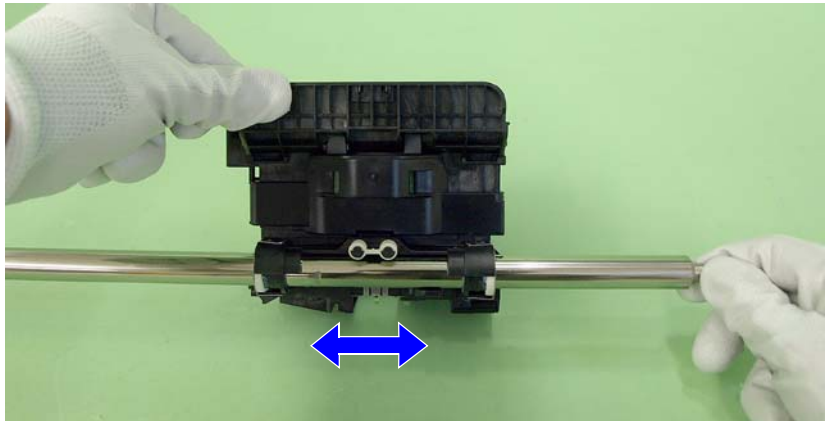


Figure 5-20. Lubricating the Carriage Shaft (2)

4. Move the Carriage Unit to the right end of the Carriage Shaft viewing the Unit from the rear, and lubricate grease with the syringe at the point shown in refer to Figure 5-21.

Lubrication Type	Lubrication Amount
G-71	140mg ± 10mg x 2 points

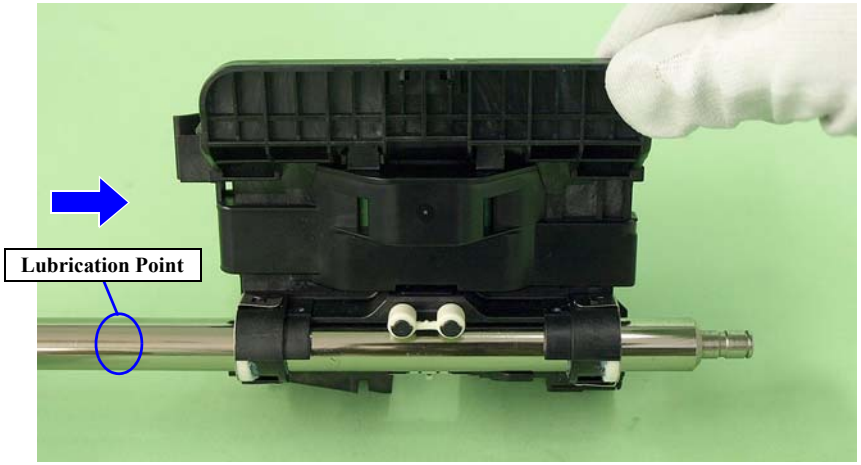


Figure 5-21. Lubricating the Carriage Shaft (3)

5. Hold the Carriage Unit, and while turning the Carriage Shaft, move the Carriage Unit to the left end of the Carriage Shaft to lubricate the grease evenly.
6. Lubricate grease with the syringe at the point shown in refer to Figure 5-22.

Lubrication Type	Lubrication Amount
G-71	140mg ± 10mg

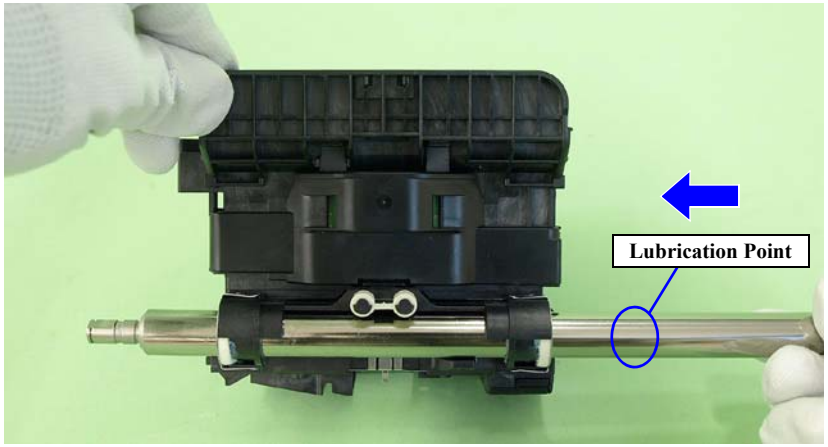


Figure 5-22. Lubricating the Carriage Shaft (4)

7. Hold the Carriage Unit, and while turning the Carriage Shaft, move the Carriage Unit to the right end of the Carriage Shaft to lubricate the grease evenly.

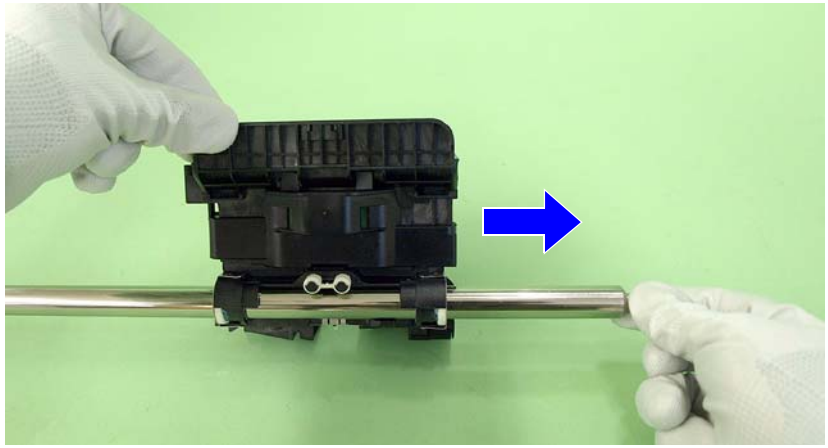


Figure 5-23. Lubricating the Carriage Shaft (5)

8. Repeat step 4 ~ 7.

CHAPTER

6

APPENDIX

6.1 Connector Summary

This section shows the connections between the main components of the printer.

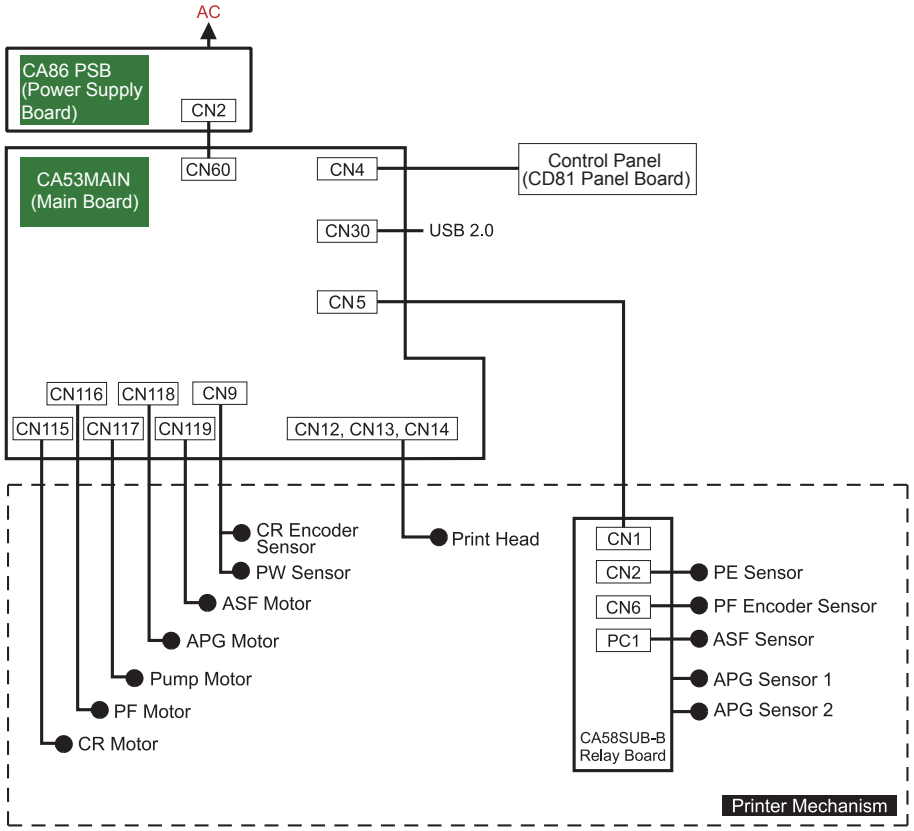


Table 6-1. Connection of the Major Components